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In this Issue

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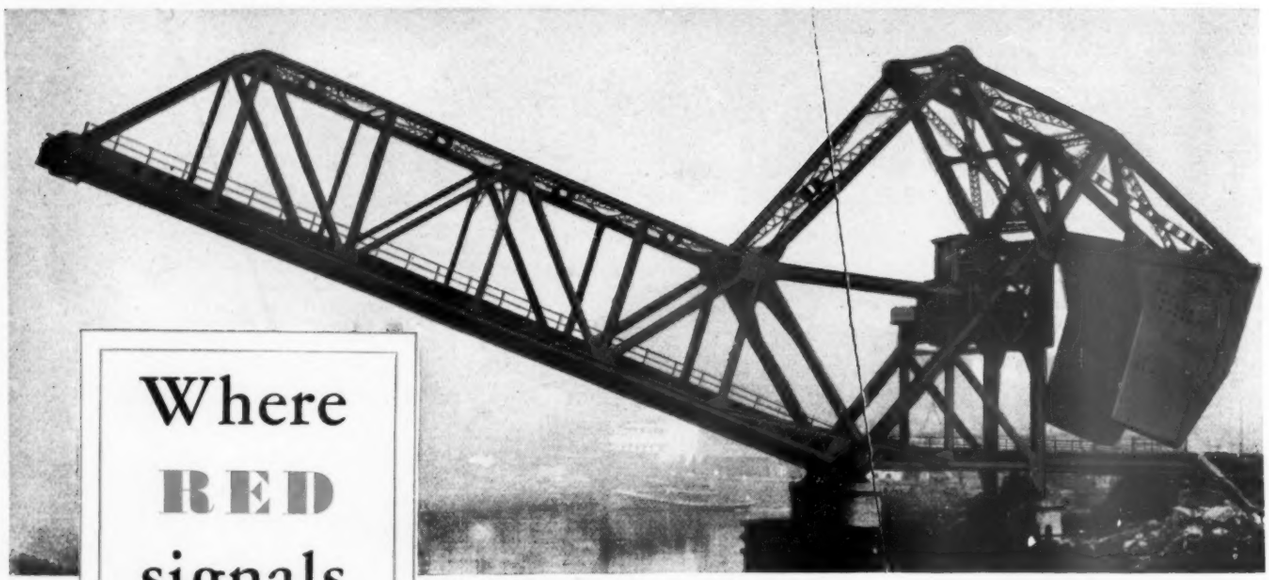

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DUTCH BOY RED LEAD

Railway Age

Vol. 89, No. 10 September 6, 1930

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Changed Conditions and Railway Competition

REGULATION of the railways has been based upon the assumption that they are a quasi-monopolistic industry. The fact is that there always has been intense competition between the railways. During the first three-quarters of a century of their history, competition in rate-making reduced their rates so fast that they had great difficulty in making adequate earnings, and often failed to do so, even when their traffic was increasing with phenomenal rapidity. The adoption of effective government regulation of rates about a quarter of a century ago stopped some of the worst competitive practices that favored big shippers and adversely affected earnings; but competition in service is probably more intense now than ever before, and competition in rate making and in other ways for the traffic of big shippers has never ceased, and continues adversely to affect earnings.

Probably the most important fact regarding present competition between the railways is that *it is being carried on under conditions widely different from any which ever existed before.* It is because of this change in conditions that competition between the railways has become an unprecedented menace to them. When conditions change so radically it is obviously wise to make corresponding changes in methods.

Competition for Reduced Business

Railway passenger earnings in 1930 will be about $525,000,000 less than in 1920. Each railway has suffered part of this loss, although some have lost relatively more than others. The loss suffered by each has been due to the same cause—competition of motor vehicles. The loss of 40 per cent of annual passenger earnings has made passenger service a highly unprofitable branch of the business. Nevertheless, the railways are competing as intensely for the 60 per cent of their passenger business that is left as they formerly did for 100 per cent of it. There is very little cooperation between them to reduce the cost of handling this largely reduced business, although in a few territories passenger service has been pooled.

Is it not possible that between many large centers where the railways are competing both with each other and with motor vehicles there might be adopted cooperation which would result both in reducing the cost of their own service and in more effective meeting of motor vehicle competition? Why, for example, should the railways operating between Chicago and St. Louis continue to run so many trains that leave and arrive at the same hours when by staggering their trains they could reduce the total number of them, and, at the same time, furnish a more frequent service which, it would appear, would help them to compete more effectively with motor vehicles? The most dangerous competitors of the railways for passenger business at present are not other railways but motor vehicles. Why, then, should they fight each other so fiercely instead of presenting a united front to the common enemy?

While they are confronted with this enormous loss of passenger earnings, their outlook for freight business is far from satisfactory. The increase of railway freight business within the last decade has been relatively much the smallest in history. Motor trucks are taking a rapidly increasing amount of traffic. The government is developing inland waterways. Pipe lines are being projected to carry a greatly increased amount of oil and gasolene. Improvements in the use of fuel have arrested the increase of, and may even permanently reduce, shipments of coal. These are only part of the influences that are tending to reduce the growth of railway freight business. Until the last decade the railways could always rely upon a large increase in freight business partially or completely to offset the effect of a reduction of freight rates. The time when they could do so seems to have passed. This change and the loss of passenger earnings have greatly increased the danger of constant reductions of rates, whether made by the Interstate Commerce Commission or by the railways voluntarily. There are many rates that are too low and should be advanced. The Interstate Commerce Commission repeatedly has called attention to this, but competition between the railways makes their traffic officers afraid to take the initiative in advancing rates lest they antagonize big shippers and cause diversion of traffic from the railways taking the initiative. Under the pres-

sure of competition many rates also are constantly being reduced.

United Action to Resist External Influences

There seems to be only one solution of the problem of preventing competition from reducing freight earnings, and that is for the railway executives to unite in adopting and enforcing measures for that purpose. Experience has sufficiently demonstrated that the traffic officers of individual lines are either unable or indisposed to resist the pressure of the big shippers from whom it is constantly necessary for them to solicit business. Only by groups of railways acting in unison under the direction of their chief executives can that pressure be effectively resisted.

The pressure of traffic now used by many big shippers to influence railway purchases must be similarly resisted. The railways themselves are largely responsible for present practices of this kind because many of them have used and still use their purchases to influence traffic. In the long run, however, in the game of using purchases to influence traffic, and traffic to influence purchases, the railways are bound to lose, because the result never is to increase the total amount of traffic, while one of its results is almost certain to be unnecessarily to increase the operating expenses of the railroad industry. By united action the railway executives could stop the trading of traffic for purchases and vice versa, and there does not seem to be any other way to stop it.

Two Great Problems

In his article in the *Railway Age* for August 16, F. J. Lisman said: "Changing conditions which during the last generation have affected nearly every walk of life can best be faced by the railroads as a group, instead of singly." This statement summarizes both the developments that have created the railway problem of today and its only possible solution. Changing conditions have subjected the railroad industry to numerous powerful external influences to which it was never subjected prior to a decade ago, without relieving it of the pressure of other external influences that always have tended to reduce its net operating income. It is still subject to the organized pressure of employees for advances in wages and to the pressure of government regulation for reductions in rates; and it has become subject to the pressure of largely new competition from other means of transportation. Its freight business is being adversely affected by numerous changes in industrial and commercial policies, and especially by improvements in the use of coal which in the past has afforded about a third of the total tonnage.

Because of the changes that have occurred the industry is confronted with two problems of the greatest difficulty. One of these is that of conserving its total earnings when the trends of both freight and passenger traffic have entirely changed. The other is that of reducing the cost of handling each unit of traffic, which was comparatively easy when traffic was growing rapidly, but is far harder when, of the two important kinds of traffic, one is being lost, and the other is growing only one-third or one-fourth as fast as formerly. Such competition between the railways themselves as has prevailed in the past, and prevails now, will only help to make the solution of these problems more difficult, or even impossible.

The most dangerous enemies of each railway now are not the railways with which it competes, but the external influences to which every part of the railroad industry is subject, and they should be acting unitedly in dealing with these external influences instead of trying to get advantages over each other by cut-throat competition within the industry itself.

Looking Forward to Better Maintenance

THAT construction engineers of today are more prone to look forward to the effect that their acts of commission or omission may have later on railway maintenance is evidenced in many ways. These bits of evidence are not isolated, but can be found on almost any project of importance. An example is the fact that tunnels now are almost invariably lined during the construction period with permanent materials such as concrete or brick instead of with timber which must eventually be replaced under traffic, thus increasing both the difficulty and the cost of the work.

Not many years ago the construction forces ignored the question of subsurface drainage in cuts, leaving this work to the maintenance organization to do as best it could while contending with material which was washing or sloughing from the side slopes. Today, on one line and grade-revision project of more than ordinary magnitude, every cut that shows any evidence of water is being tiled, and surface drainage is being given the same careful attention. Under the former practice wet cuts and "soft track" were the common experience for several years after the line was opened for operation, and maintenance was either inadequate or carried out at unreasonable cost.

Formerly, when grading equipment consisted almost entirely of scrapers and wagons, the problem of compacting embankments was solved almost automatically by the requirement that they should be constructed in horizontal layers. At a later period, before motorized equipment of large capacity came into general use, this advantage was eliminated through the use of dumping trestles which were constructed to approximately the full height of the embankment, so that, for some years settlement was often excessive and extremely troublesome, from the point of view of maintenance.

On two projects that are under way at present, in order to minimize maintenance troubles as much as possible, there has been a reversion to the older methods of compacting embankments. On one of these pro-

jects, all fills, whether placed by train or wagon, are being built up in 2-ft. horizontal layers the full width of the embankment. On the wagon fills, the tractors and wagons are required to traverse the fill in both the loaded and empty directions. In the fills made by train, the filling material is spread in two-foot horizontal layers by means of bulldozers, and each layer is thoroughly compacted by a ten-ton roller or its equivalent. On the other project the same precautions are being taken and, in some instances where the stability of the material is open to question, as an added precaution, the embankment slopes are being made 2 to 1.

Other examples in plenty can be given, some of which would be recognized as common present day practice. These are sufficient, however, to indicate the trend away from the former attitude of many construction men of high ability and wide experience, who regarded it as better to leave to the maintenance forces those tasks, the need for which would develop as operation continued, and which their training better fitted them to perform. The present trend is to include in the original construction program as many items as experience has taught will be of direct benefit in decreasing maintenance difficulties and costs.

The Story of Car Loadings

THE changes in car loadings of freight on the railways probably indicate the changes in general business as accurately as any other measure. The depression this year has been the most severe since 1921. Relatively less of the total freight traffic of the country is handled by the railways now than a decade ago, but there has been no change within the last year in the relative amount of the total traffic handled by the railways that prevents a comparison of the declines in car loadings in 1921 and in 1930 from indicating the comparative declines in general business activity that occurred.

The statistics in the accompanying table show how car loadings declined in the first eight months of 1921 as compared with the corresponding part of 1920, and in the first eight months of 1930 as compared with the corresponding part of 1929.

Table 1—Decline of Car Loadings

	1920-1921	1929-1930
January	13.9 per cent	6.2 per cent
February	11.8 per cent	6.9 per cent
March	18.6 per cent	8.2 per cent
April	3.4 per cent	9.2 per cent
May	11.8 per cent	11.1 per cent
June	15.0 per cent	12.9 per cent
July	16.8 per cent	14.4 per cent
August	15.9 per cent	16.7 per cent
Average	13.8 per cent	10.7 per cent

The figures show that in January, 1921, there was a decline of almost 14 per cent in car loadings and that, while there were fluctuations in the decline, it averaged 13.8 per cent in the first eight months of the year, or almost exactly the same as in January. On the other hand, in 1930 there was only a small decline in January, but the decline continued at an accelerating rate until it reached almost 17 per cent in August, with the result that the average decline in the first eight months of the year was almost 11 per cent.

It is too early as yet to say whether this year's traffic has shown relatively as large a decline as compared with that of last year as it is going to show. Unfortunately what the figures do show is that, in spite of all predictions to the contrary, general business activity did not begin to increase in the early part of the second half of this year.

The Cost of Company Material

ANYONE familiar with storehouse, supply-car and work-train operations knows that railroads are shippers, but few know how much shipping they do. When a car of company material reaches a railway, it must be hauled to the unloading point, and the first destination is seldom the last one. Materials acquired to replenish stocks usually move through several storehouses before they reach the user, and less-than-carload shipments usually require handling through several freight houses. Switching and other costs, known and hidden, are added again and again. The situation is little different in the case of scrap and second-hand materials, and also shop-manufactured materials, excepting, perhaps, that the value of the material is less to start with and the handling likely to be less carefully supervised.

In 1921 the Class I railroads carried 1,690,000,000 tons of revenue-producing freight. The non-revenue freight for the same year amounted to 217,000,000 tons, or about 11.4 per cent of the total freight carried. In 1929, when the roads carried 2,427,000,000 tons of revenue freight, the non-revenue freight amounted to 268,000,000 tons, or to about 10 per cent of the total handled. How much transportation did this business involve? The Class I roads carried 306,800,000,000 ton-miles of revenue freight in 1921, and the non-revenue freight amounted to about 34,000,000,000 ton-miles, or 10 per cent of the total, while, in 1929, when the revenue business amounted to 492,000,000,000 ton-miles, the non-revenue freight amounted to 45,000,000,000 ton-miles, or 8.4 per cent of the total.

Since the non-revenue freight consists almost entirely of railway materials and supplies, this means that approximately one-tenth of the freight hauled by the railways is railway material. Can it be supposed that, because this material earns no revenue, the railroads incur no expense in handling it? The facts are that transportation of company material carries with it expenses comparable to the cost of carrying revenue freight. It requires equipment, train crews, dispatching, superintendence and other transportation expense, and also contributes to wear and tear. According to the Interstate Commerce Commission's allocation of

operating expenses between freight and other service, the average total operating cost of moving a ton one mile is about 7 mills. Assuming that the average cost of handling company freight is 5 mills per ton-mile, the total operating expense of handling it in 1929 was $225,000,000. Here, certainly, is an element of material cost which commands attention, particularly at a time like the present when reduced revenues have forced the railroads to make drastic reductions in their operating expenses.

The problem of studying this expense is not the problem of the purchasing and stores departments alone. Much of the non-revenue traffic is coal, ballast and engineering materials. Ice and cinders are items. The supply organizations' opportunities, however, are large. Usually they do the shipping of the railway lumber, the iron and steel used, the oil and similar supplies, including the handling of scrap, which run into tonnage. They also order and deliver a great variety of supplies, which, while not impressive from a tonnage standpoint, often cause transportation and other handling expense far out of proportion to their weight.

It may well be asked, therefore, if the purchasing and stores organizations are managing their work with a full knowledge of these transportation costs. Can completely-centralized storehouse and reclamation operations be justified, for example, where the backhaul on some commodities is large? Is it a wise purchasing policy that disregards line haul when comparing prices? Is hand-to-mouth buying so economical when it multiplies less-than-carload and express shipments? Are supply trains a necessity or a luxury, in view of their cost of operation? These are only a few of the questions that arise when the freight is considered, but they suggest the responsibility and problems, and the efficiency of supply work surely depends somewhat on how intelligently they are met. The expense of hauling company material can be indifferently considered, but the expense is there just the same and is a challenging factor in material costs.

Pension Financing

TWO years ago the *Railway Age* published a series of editorials discussing various phases of the pension problem on the railways. Incidentally, the difficulties experienced in the railway field—except for some special features—do not differ greatly from those encountered in other types of industries. These editorials stimulated considerable discussion, but, far more important, they have since been used as a basis of study and research on the part of a number of railroads.

The funding and financing of pension plans, difficult in any field, is particularly so on the railroads of this country because of the Interstate Commerce Commission requirements. This was emphasized in the article on Funding Railroad Pensions, by J. C. Clark, in the *Railway Age* of August 2, 1930, and is further discussed elsewhere in this issue by Hayes Robbins in an article, entitled, "Clearances Needed in Railroad Pension Financing."

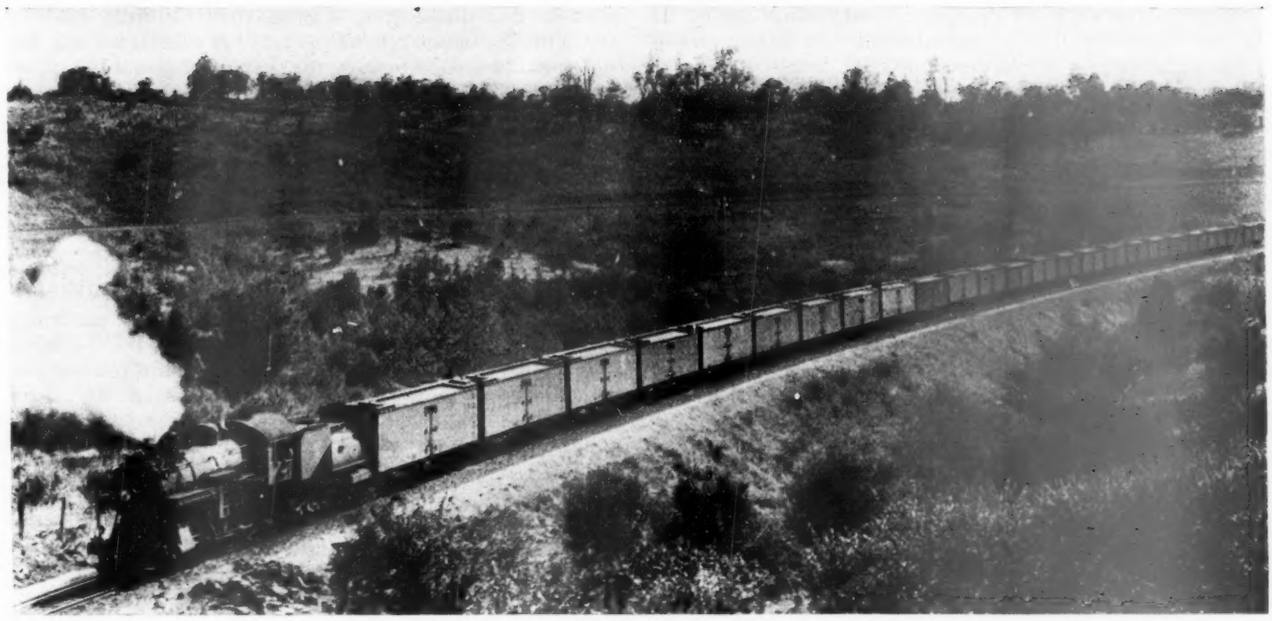
Is not the time at hand when the railroads, in cooperation with the Interstate Commerce Commission, should squarely face up to this problem and take steps to put the financing of pensions on a more businesslike and stable basis?

Safety and Production

ONE of the ablest and most practical discussions of safety that has been delivered before a body of railroad men recently was that by W. A. Kuechenmeister, personnel manager of the Dominion Forge & Stampings Co., Walkersville, Ont., at the annual meeting of the Master Car Builders' & Supervisors' Association which was held in Detroit, Mich., on August 26 to 28, inclusive, as reported elsewhere in this issue. The association, which changed its name during the convention to the "Car Department Officers' Association," discussed safety measures at one of its sessions, inviting the specialist on this subject from the Dominion Forge & Stampings Co. to make the principal address.

The most striking single point emphasized by Mr. Kuechenmeister was the way in which safety work and production efforts are related. He pointed out that when car shop supervisors, or any other plant executives for that matter, have done all of the things necessary in the interest of safety, they have thereby done exactly the things needed to promote greater shop efficiency and maximum unit production. For example, cleanliness and order are no more essential to safety than to high production. The right kinds of tools, properly safeguarded, promote both safety and output. The use of proper materials not only avoids hazards but, in the long run, saves replacement time and cost. Adequate instruction regarding production cannot be given without at the same time placing due emphasis on safety.

With all of the foregoing essentials provided for, the task of supervision, from the standpoints of both safety and production, is minimized. The problem of the new employee, also, is no real problem under these conditions. If all of the employees in a certain department are required to wear goggles, for example, and live up to instructions in this particular, what new man would venture to be an exception to the rule? And if he tried, how long could he leave off his goggles under the adverse comments of fellow workers? Unquestionably, there is much merit in Mr. Kuechenmeister's contention that, entirely aside from important economic and humanitarian advantages, from the point of view of increased production alone, safety work brings no added burden to management.



A Fruit Block Climbing the Mountain on the Sacramento Division of the Southern Pacific

Operating a Mountain Division

*Southern Pacific handles heavy traffic across the Sierra Nevadas**

By W. L. Hack

Division Superintendent, Southern Pacific, Sacramento, Cal.

THE mountain section of the Sacramento division of the Southern Pacific extends from Sparks, Nev., on the eastern slope of the Sierra Nevada mountains, to Roseville, Cal., on the western slope, 138 miles. From Roseville to Colfax, 36 miles, the gradient is 1.5; eastbound from Colfax to Emigrant Gap, 31 miles, 2.4 per cent; and from Emigrant Gap to the summit at Norden, 22 miles, 1.8 per cent. The elevation at Roseville is 200 ft. and at Norden, 7,000 ft., or a tonnage lift of 6,800 ft. in 89 miles.

My responsibility as the superintendent of this division is to move a peak traffic of 75,000 cars of perishable commodities on a definite guaranteed schedule, over this mountain railroad. This traffic reaches a maximum of 1,200 cars a day, and an average of 750 to 800 cars for a period of two months.

Preparation Essential

Every activity from the hour that the last car of the peak season is lifted over this 7,000-ft. wall is directed toward a well-planned preparation for handling the next peak load successfully. There are many factors to be considered in such preparation. It is imperative that 138 miles of double track be properly maintained. We must ascertain on what portion of this 138 miles we can start to lay 130-lb. rail and renew ties and ballast, in order to obtain maximum efficiency from the trackmen and insure minimum delay to the moving units. The maintenance of the considerable mileage of snowsheds and tunnels on the division must also be considered.

The maintenance money is apportioned in such a manner that the work from Roseville to Gold Run on the west end of the division, and for an equal distance on the east end, will be completed by July 1. This program insures maximum efficiency in track work with the minimum delay to moving units which, it has been determined, move over the portions of the district enumerated during hours not within the maintenance man's tour of duty.

Our tie renewal problem has been simplified by the application of a gage plate, invented by W. H. Kirkbride, engineer maintenance of way and structures, of the Southern Pacific. We formerly put in untreated ties on ordinary curves because the adzing of the ties in setting up the rail wore them out in about three years, a life precluding the use of creosoted ties. The gage plate corrects this. On 8 and 10-deg. curves the ties so protected are in as good condition after three years as when installed.

Another preparatory measure is to construct such facilities as side tracks in advance of the peak movement. In the valley a side track costs approximately $5 a lineal foot, but on a mountain railroad, where

* Abstracted from a paper presented at the June meeting of the Pacific Railway Club.

you cut it out of solid granite, it costs much more. It is the superintendent's responsibility to know, when such a facility is constructed, that it meets a definite need in efficient operation.

Extent and Time of Peak Movement

The actual movement of 1,200 cars a day follows after these preparations. These cars of perishables originate on neighboring divisions and in the foothills on my own division. It has been determined that 60 per cent, or 720 cars, of this peak day's business will move out of Roseville between 3 p.m. and 7 p.m. and the remaining 480 cars between 7 p.m. and 3 p.m. Our schedule requirements provide that these 1,200 cars must make their departure from Roseville with the last schedule applying as of 6:59 p.m., which necessitates placing these freight trains on a 25-min. headway out of Roseville. That is pretty close on a mountain railroad. Our first train of perishables from neighboring divisions reaches Roseville around 2 p.m. and we have 500 cars of perishables to move between this arrival and 6:59 p.m. On the arrival of the train, the cars must be re-iced, bad orders and diversions switched out, cars and retainers inspected, proper piston travel insured, all of this while the train is standing on the icing track. The general yardmaster at Roseville must see that these trains leave Roseville 1 hr. and 30 min. after arrival. He must be educated to load the trains so that the schedule of fruit blocks will be maintained. The first train of the day cannot be loaded to tonnage because it has been determined that full tonnage produces a speed of only 10 m. p. h.

Each day is a distinctive problem. If we have six units today, we won't operate the same as we did yesterday when we had nine.

In order to handle this peak load successfully, it is essential that we predetermine the speed of our moving units to insure that schedules be maintained. A rule that applies and is fundamentally sound is not to have speed by spurts and jumps, but to know the actual requirements and so arrange the operation that we meet the requirements exactly. During the preparatory period, freight trains are ridden by the trainmaster and myself, one of us on the engine, the other in the caboose. Each length and weight of train is carefully checked with the various classes and combinations of classes of power; from a careful study of these checks we have set up the performance the train should make; for example, we have determined that in our movement of the peak load, each unit should move from Roseville to Newcastle in 42 min. It used to be 1 hr. 42 min.

Braking on the Mountain

We set a speed of 20 m.p.h. on the mountain grade. When we leave the summit, the retainers are up and we are ready to go down the 1.8 grade line. We pull out of Norden, the summit, at a speed of eight miles per hour. Powerful floodlights enable the brakemen to make a thorough rolling inspection. The engineer makes an application and ascertains that a 10-lb. reduction controls the train at 20 m.p.h. In reality, he destroys its momentum. From Norden to the first inspection station is seven miles. In that distance the trainmen have an opportunity to determine what is happening in the way of piston travel. If 10 lb. will hold the train at 20 m.p.h. and it increases speed to 23 miles an hour, it will take 12 to 15 lb. to hold the train. That does not seem much, but it has been our experience that the car with the four-inch piston travel will go along with anything for the first seven miles. If at this first inspection station the trainman finds a car with the wheels running hot, he must exercise his judgment as to whether the retainer remains up or down.

No matter how many cars are being handled down the mountain grade, the wheels become heated, but the stop at an inspection station should not be in excess of 10 min. This is sufficient time to enable trainmen to make a thorough inspection without hurrying.

Educating the Men

Each fireman is a summertime engineman, working as such for three months and then going back to firing. That is his method of employment for years. If this fireman is treated as a fireman during the slack period, he will be up in the middle of a procession of trains on a 25-min. headway in the peak period and his errors of judgment will be numerous. These men must be educated, during the time that they are working as firemen, to appreciate the importance of maintaining the proper speed of each moving unit. Failure to do so results in slowing up the trains behind. The speed of the moving units in the peak procession, with their expensive crews, is important.

One of our most frequent locomotive ailments on the mountain railroad is that the engine gets too much water. The packing for locomotives costs $1.50 a lb. If it isn't squeezed out by water, it will run as long as four months. But if it is squeezed out by water, the locomotive blows until it is worthless. We educate the enginemen to run on steam and not water.

Eating may not seem to enter into railway operation, but in this case it does. In order to maintain the carefully set up schedules, we have established at Blue Canon, where we have a 71-car siding, two eating houses, one at each end of the siding. With this method there is no eating at intermediate stations and the stabilized delays are under our control. Also, to facilitate the movement of the empty refrigerator cars west, we maintain an eating house at Norden. A train arrives at Norden from the east, the retainers are turned up, a plug test is made, the train is dropped down to clear, the crew eats, and is gone in 50 min. During the peak season the first crew eats at Norden, the next crew cuts the helper out and drops down to Troy where we maintain an eating house on the summer siding. These eating houses save us at least two sidings.

Our experience has been that when headlights get thick, the maximum traffic density in the eastward direction is at Blue Canon, where locomotives take water, and the train and engine crews eat. This means that each of the trains leaving Roseville on the 25-min. headway will be at Blue Canon 45 min. The cost of blasting sidings out of solid granite is prohibitive. To overcome this obstacle we establish and maintain during the peak season two staff stations, costing $18,000 to operate, and run eastward passenger trains four miles over the westward track. It takes 11 min. to cover the four miles in absolute safety, for possession of the staff gives complete control over the territory so governed. By this method we hold five trains of perishables on the eastward track at our eating station. All five crews eat at once, take water at once and are ready to leave in 45 min.

Handling Passenger Trains

One of our problems is to run 16-car passenger trains up and down the 75-mile slope, with 2.4 per cent grade, and avoid complaints as to rough handling in starting or stopping. Every available retainer is used

on these trains. In stopping 16 cars on the 2.4 ascending grade, we keep the throttle open wide enough so that, when we are ready to stop, the engine will not run into the train. While moving at a speed of 10 or 12 m.p.h. we release the automatic three or four car lengths before the stop is to be made, with the throttle slightly open, working steam. If we use a 7- or 8-lb. reduction, we pull off 15 lb. while standing, to insure that all brakes are released. In starting, since we know the slack is out, we ease off the independent brake until the cars start to roll back. At the moment that the last of the independent is off, we open the throttle.

Just before encountering the down-grade, with a 16-car train, the engineman makes a running of 7, 8 or 10 lb. If he makes a 12-lb. reduction, it is enough to apply the brakes fully. Having determined the proper braking, he continues it, so that the speed doesn't pick up, affording the trainmen an opportunity to turn up every available retainer on the train. If his maximum speed is to be 28 m.p.h. on the curves, and the train still gathers speed, the engineman splits the first application, and applies enough pressure to reach the speed limit. He then releases the brakes and handles the train on the one-reduction method down the mountain, making the reduction that he established as satisfactory on the first reduction. Using this method, the slack is always out.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended August 23 continued the marked increase over preceding weeks which was begun the week before, after it had been showing declines most of the time since the latter part of April. The total was 940,549 cars, an increase of 18,000 over that for the preceding week, although it was a decrease of 197,417 cars as compared with the corresponding week of last year and of 140,149 cars as compared with 1928. Loading of grain and grain products showed an increase as compared with 1928 but a decrease as compared with last year. All other commodity classifications and all districts showed reductions as compared with both years. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, August 23, 1930

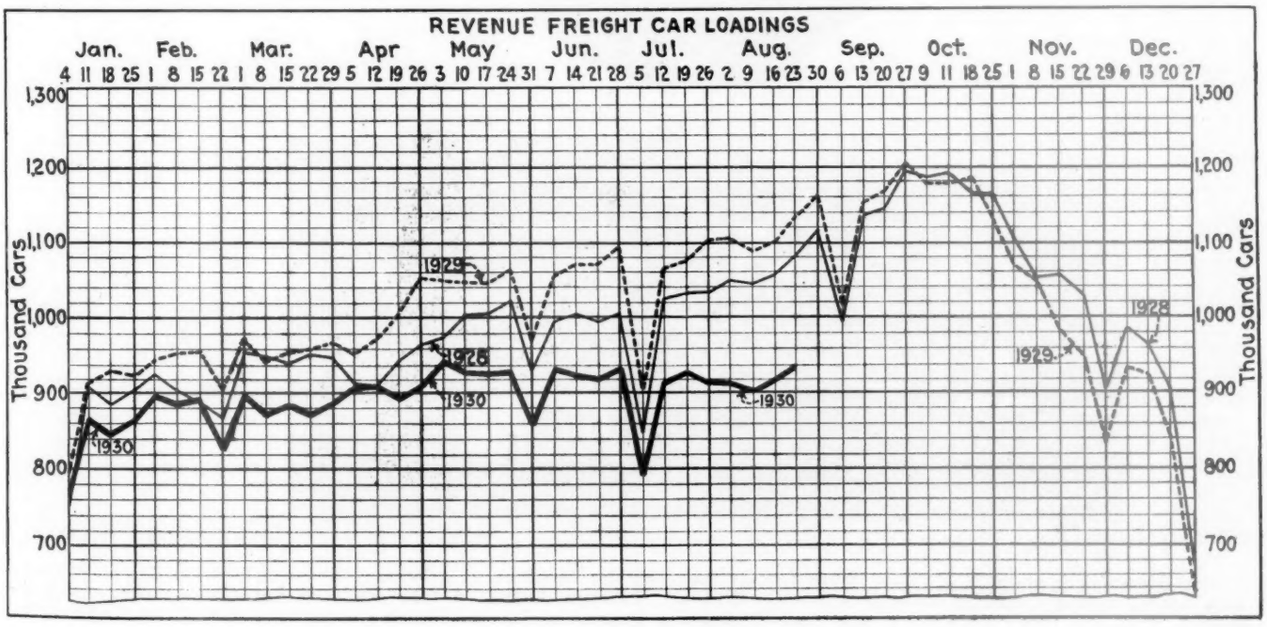
Districts	1930	1929	1928
Eastern	210,142	254,790	249,471
Allegheny	189,399	231,199	219,937
Pocahontas	54,335	63,265	56,905
Southern	122,632	148,719	141,038
Northwestern	150,666	187,852	168,857
Central Western	138,280	162,969	161,579
Southwestern	75,095	89,172	82,911
Total Western Districts	364,041	439,993	413,347
Total All Roads	940,549	1,137,966	1,080,698
Commodities			
Grain and Grain Products	57,786	61,831	56,180
Live Stock	21,843	26,202	26,953
Coal	152,908	174,784	173,116
Coke	7,853	12,002	9,341
Forest Products	41,376	69,663	67,074
Ore	55,081	75,736	66,011
Merchandise L.C.L.	236,423	261,800	257,289
Miscellaneous	367,279	455,948	424,734
August 23	940,549	1,137,966	1,080,698
August 16	922,823	1,102,567	1,057,909
August 9	904,157	1,092,153	1,044,268
August 2	918,335	1,105,920	1,048,821
July 26	919,349	1,102,553	1,034,326
Cumulative total, 34 weeks	30,448,901	34,215,637	32,637,510

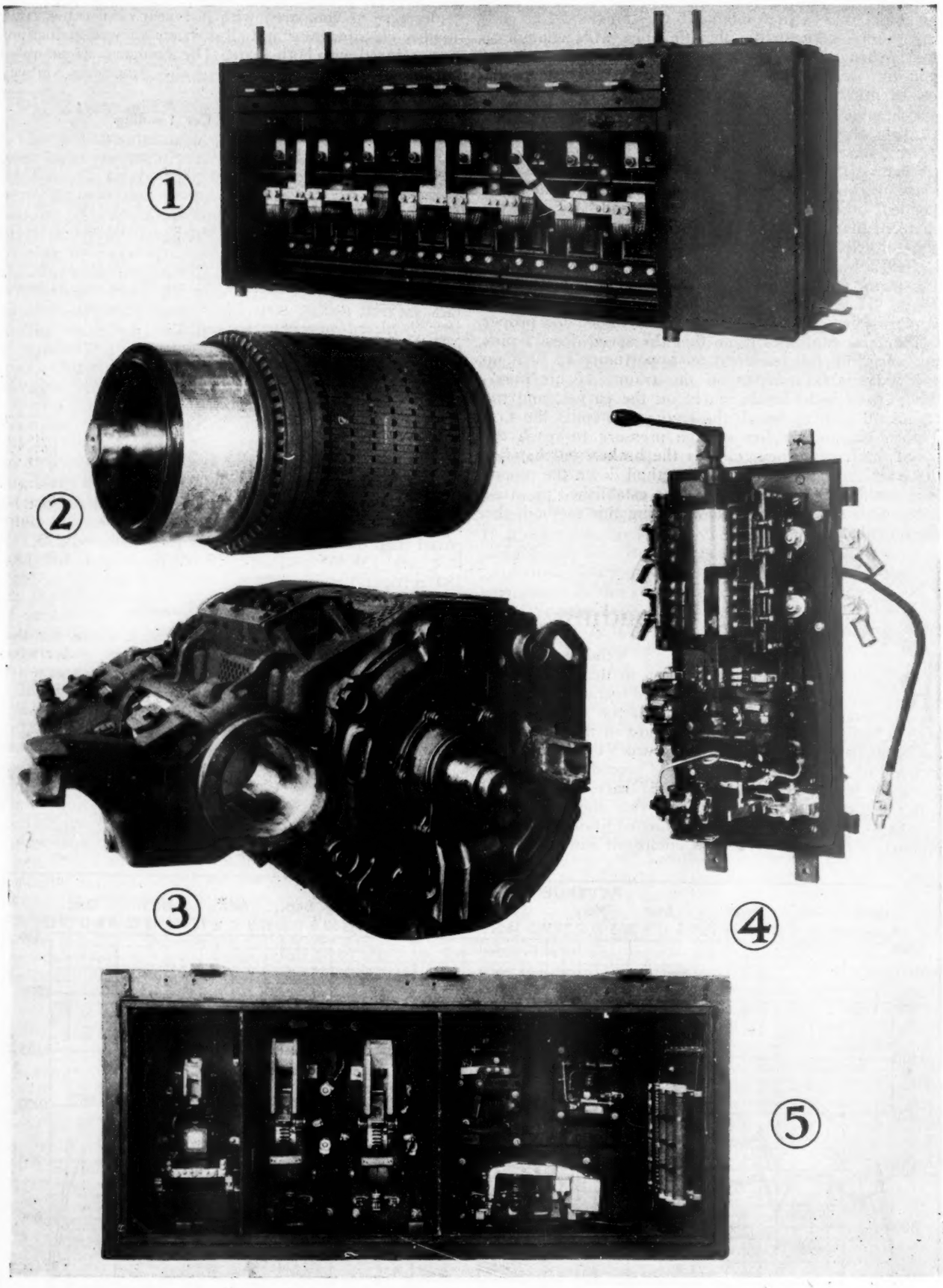
The freight car surplus for the week ended August 14 averaged 438,710 cars, a decrease of 8,511 cars as compared with the week before. The total included 225,357 box cars, 158,455 coal cars, 25,422 stock cars, and 13,184 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended August 23 totaled 64,014 cars, a decrease of 29 cars from the previous week and a decrease of 5,833 cars from the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
August 23, 1930	64,014	30,247
August 16, 1930	46,043	29,276
August 9, 1930	61,272	29,095
August 24, 1929	69,847	38,120
Cumulative Totals for Canada		
August 23, 1930	2,012,582	1,153,324
August 24, 1929	2,259,795	1,410,663
August 25, 1928	2,205,974	1,323,976





1. The Electro-Pneumatic Unit-Type Main Circuit Switches are Mounted in a Welded Box—2. Traction Motor Armature with Spring-Bound Commutator and One-Piece Coils—3. Traction Motor—4. The Reverser has Contact Fingers of Improved Type—5. Electro-Magnetic Bus Line Contactors Instead of Electro-Pneumatic Switches and One Overload Trip Instead of Two Reduce Weight and Space Requirements

Improved M. U. Cars Placed in Service By the New Haven

The Motors on Each Motor Car Have a One-Hour Rating of 1040 Horsepower

Recent developments in alternating current traction provide equipment which is lighter, simpler, more powerful and superior in performance to older types

By A. S. Marthens

Railway Equipment Engineering Department,
Westinghouse Electric & Manufacturing Company

THE New York, New Haven & Hartford has placed in service additional multiple unit motor car equipments which are simpler but more powerful than those which have been so conspicuously successful since multiple unit operation was inaugurated on this road in 1912.

These latest equipments, as well as the first ones, were manufactured by the Westinghouse Electric & Manufacturing Company. Also, like the other New Haven cars, these operate on both alternating current from overhead wire at 11,000 volts and direct current from third rail at 650 volts. The motors are, therefore, of the series-commutator resistance-lead type but differ from the type 409-D used in the earlier equipments in that they include improvements which have resulted from the developments of recent years. Interpole field windings have been added and the number of brushes has been reduced. The commutator is of the spring type in which the pressure on the V rings is maintained practically constant by a heavy steel disc spring. With this construction, the commutator will remain tight while the mica between the bars seasons in service, and the spring will maintain practically uniform pressure as the copper segments expand and contract with changes in temperature.

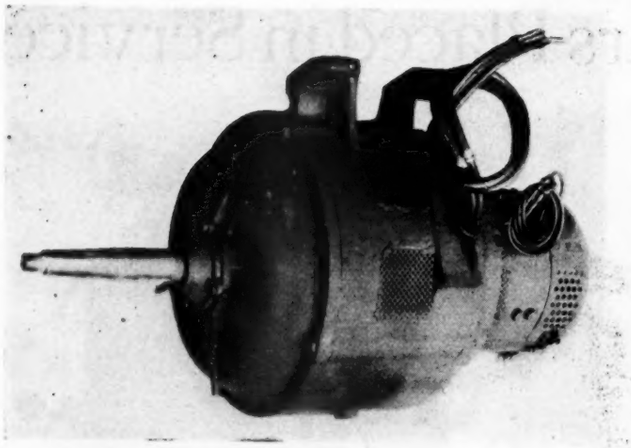
The armature slots in the new type 421-B motors are open, making it possible to use one-piece coils instead of the two-piece type employed in the older motors. The result is a more rugged winding, similar to a d.c. motor winding except for the resistance leads.

The armature shaft is equipped with roller bearings with the expectation of greatly increasing the mileage between lubricating periods. The axle bearings are babbitt-lined, waste-lubricated and have oil-sealed axle caps.

The greater power of the new motors permits hauling three 52-ton trailer cars instead of two as previously. The motors are rated at 260 horsepower, one-hour, giving a total of 1040 horsepower for the car. Though so greatly increased in power, this motor weighs only 170 pounds more than the old motor and requires but little change in the truck.

A new feature of the truck, however, is the motor suspension which consists of leaf springs both above and below the motor nose to reduce shocks to the gearing and the suspension points. Flexible gears of improved design are also used. The gear ratio is such that these new equipments will run in trains with the older equipments. Field shunting is used for d.c. operation because the motor is designed for higher voltage than the type 409 motor.

Unit switches for the main motor circuit are of a



The Blower Motor Drives the Control Generator as Well as the Blower Wheel

new type having large arc-rupturing capacity. They are removable as a complete unit, including the blow-out coil and pole pieces. It is therefore possible to completely assemble switches in the shop and have them ready for quick installation when needed. The arc chute may also be removed separately.

The unit switches are mounted on angle iron supports in welded steel boxes, on the end plates of which are mounted the a.c. and d.c. line relays and the a.c.-d.c. control and compressor motor change-over switch. Previously the relays were mounted in a separate box and the change-over switch in another. Bringing these parts into the switch groups not only reduces the weight of the equipment but it also simplifies the mounting of the apparatus, the cable conduit runs, the wiring, and the maintenance routine.

New reversers of increased capacity are provided. The equipment arrangement is simplified by mounting with each reverser the field-shunting switch for its pair of motors. Connections to both the reversers and the switch groups are made by bolting the car cable terminals to heavy copper straps extending outside the apparatus boxes, thus facilitating removal and replacement of the apparatus with the least disturbance of the car wiring.

Contact fingers of an improved type are used in the reversers and for the interlocks of the unit switches. Correct alinement and contact pressure are maintained by helical springs.

The motor control system differs from that previously used in that resistors are employed only for d.c., the switching from tap to tap of the transformer being accomplished by means of unit switches and a preventive coil.

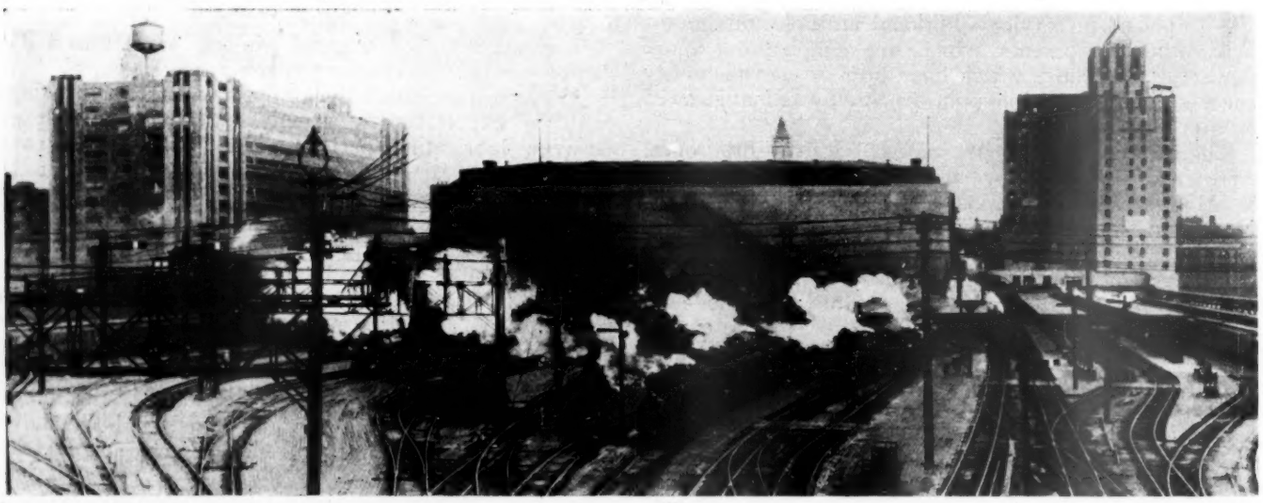
As this equipment is more powerful than previous ones, a greater supply of cooling air is provided. This has been obtained by using a larger blower and by enlarging the air intake and ducts in the car. Previous equipments had a series commutator type motor for blower drive. Energy for the control circuits and for battery-charging was provided by a motor-generator set. In the new equipments the blower motor and the motor-generator set are combined in one set consisting of an induction motor with the generator and the blower mounted on shaft extensions at opposite ends. This combination of apparatus results in reduced weight and space and simplifies the equipment. The induction motor is started by a split-phase arrangement using a small resistor and a contactor energized from the generator.

Further weight reduction and simplification are realized by substituting electro-magnetic contactors for the electro-pneumatic bus line switches. A single bus line overload trip, which operates on both a.c. and d.c., replaces the two overload trips previously used.

Protection for the traction motors is provided on d.c. by an overload trip as before and on both a.c. and d.c. by relays connected with resistors in a bridge circuit. This arrangement also affords protection against excessive motor speed due to wheel slipping.

The heating of these new cars is controlled by a thermostat and the lighting circuits have been simplified by providing increased capacity in the control generator so that it carries the lights also. This change in the low-voltage light circuits made possible the elimination of a small transformer and an electro-pneumatic lighting change-over switch.

* * * *



North Station, Boston, Massachusetts, Boston & Maine

The building in the center is the passenger station proper, in the upper part of which is the "Boston Garden." The tower visible above the roof is that of the custom house, half a mile distant. At the left is the North Station building to which recently have been moved the executive and general offices of the railroad company. These occupy the eighth, ninth and tenth floors. This building is on the site of the old granite station of the Fitchburg Railroad. At the right is the new 16-story North Station Hotel. As announced in the *Railway Age* of August 30, page 466, the Boston & Maine has recently begun work on an extensive $4,000,000 program designed to improve the approaches to this station.

Kansas City Southern Loss and Damage Rate Is Low

Claim payments in 1929 amounted to only 32 cents per $100 of freight and switching revenue

K. C. S. Train No. 55, Taken Near Westwood Hills, Kansas City, Mo.

THE loss and damage ratio of 0.32 per cent established by the Kansas City Southern in 1929 constitutes a challenge to other railroads since none of the other large lines, with the exception of the coal carrying roads, has a comparable ratio. The freight loss and damage payments for all railroads in 1929 ranged from 0.001 per cent to 2.358 per cent of gross freight revenues, but the ratios below that of the Kansas City Southern were on railroads that had smaller gross freight revenues or whose traffic consisted mostly of mine products which are not highly susceptible to loss and damage. The significance of this ratio of 0.32 per cent is further emphasized by comparing it with the regions into which the Interstate Commerce Commission divides the railroads. The ratio for the New England region was 0.54 per cent, the Great Lakes region 0.72 per cent, the Central Eastern region 0.42 per cent, the Pocahontas region (coal carrying roads) 0.19 per cent, the Southern region 0.79 per cent, the Northwestern region 0.61 per cent, the Central Western region 0.75 per cent and the Southwestern region, in which the K.C.S. is located, 0.75 per cent.

The low ratio of the K.C.S. cannot be attributed to the nature of the traffic handled, since all classes of commodities are represented. Products of agriculture constitute 8.2 per cent of the total tonnage, animal products 2.3 per cent, products of mines 27.6 per cent, products of forests 15.8 per cent, manufactured products 44.9 per cent and less-than-car-load commodities 1.2 per cent. The low ratio is a result of prevention work that had its inception in 1915. It is further magnified by comparison with the ratio of 2.43 per cent that existed in 1919.

Efforts to Reduce Loss and Damage Were Interrupted by War

The methods used by the K.C.S. in its prevention work are described by H. D. York, freight claim agent of this railroad, as follows: On June 12, 1915, all officers, agents and employees met at Sulphur Springs, Ark., to consider the problem. At this meeting, the first of its kind, it was decided that similar gatherings should be held annually, but following the second meeting on May 27, 1916, the program was interrupted by the war and none was held until May 26, 1919. With few exceptions, such meetings have been held annually since that date.

Further progress was made on October 1, 1919, when a general committee, consisting of the general manager, the traffic manager, the assistant general solicitor, the general superintendent of transportation, the chief engineer, the superintendent of car service, the freight claim agent and the chief of the freight claim prevention bureau, was formed to consider ways and means of improving the handling of freight. The general manager served as chairman and the freight claim agent as secretary.

It was decided to conduct an intensive freight loss and damage prevention campaign along educational and instructive lines under the direction of the freight claim agent. While some preliminary work had already been done through the chief of the freight claim prevention bureau, who was appointed on November 1, 1918, traveling inspectors were added to carry on the campaign properly. The big waste was explained to the men actually handling the business in a way to create interest in the undertaking and promote co-operation. These inspectors are still continuously so engaged and, in addition to explaining the requirements and instructions governing the handling of freight, they make reports of the conditions relating to the prevention of loss and damage in detail to the freight claim agent and the superintendent so that appropriate action for correction when necessary can be taken promptly. These men inspect stations, yards, warehouses, platforms, freight in warehouses, loads in yards, the handling of cars, and the records and methods of handling in general; they ride freight trains, particularly locals, and observe handling; supervise the handling of

freight involved at wrecks and derailments; visit shippers and consignees to promote co-operation, and make investigations in connection with claims, over, short and damage and other reports.

During the seasonal movement of fresh fruits and vegetables originating along the line, an inspector is assigned to the general supervision of all the handling. In addition, an inspector supervises the hauling of Irish potatoes, another the movement of cotton, and another special movements such as sewer pipe. When occasion arises an inspector is delegated to make special investigations in connection with livestock or any other class of business. The reports of the inspectors are carefully checked in the freight claim prevention bureau and every feature is followed up in an appropriate way to a definite conclusion.

Officers and employees are encouraged to report irregularities and, as a convenience, suggestion cards addressed to the freight claim agent are provided. The movement of perishables and livestock is checked closely and all failures in service are thoroughly investigated. All irregularities and mishandling developed in the investigation of claims, or over, short and damage and other reports are brought to the attention of all concerned. A particular effort is made to commend those responsible for good conditions or taking extraordinary precautions to prevent loss and damage and to bring such matters to the attention of all interested.

The statement of the American Railway Association, Freight Claim division, classifying loss and damage by principal causes and commodities, is distributed to employees monthly and yearly, and special statements on specific causes and commodities are compiled from time to time. Circulars analyzing the expenditure more fully and using instances of mishandling as object lessons are also issued. Another means of reaching and interesting employees is through articles in the Kansas City Southern magazine.

Efforts Are Effective

The interest of employees is further stimulated at divisional meetings held by the superintendent. During the last year a careful-handling meeting has been called each month by the superintendent of terminals at Kansas City, Mo., and by the general yardmaster at Shreveport, La.

The results of the efforts to reduce claim payments are reflected in the fact that the amount paid per $100 of revenue in 1929 was 32 cents as compared with $2.43 in 1919. In addition, loss and damage to less than carload shipments was reduced 92 per cent or from $91,251 in 1921 to $6,954 in 1929.

Less than carload freight is checked, loaded and unloaded by employees of the carriers and under the provisions of the classification it is not necessary to accept any article which is not packed so as to stand ordinary handling and which is not properly marked. Ordinarily, shippers are glad to have attention called to any failure in this respect and co-operate in efforts to insure delivery on time without damage.

The prevention efforts have resulted in marked reductions in the payments classed according to causes. Loss and damage due to wrecks was reduced from $31,058 in 1921 to $963 in 1929, the decrease being due principally to a general improvement in the condition of tracks and equipment. Damage was reduced from $54,591 in 1921 to $41,483 in 1929 by preventing damage or additional damage through the careful handling of the freight involved and by good judgement in salvaging.

Payments due to delay were cut from $10,064 in 1921 to $4,002 in 1929, by improved service and greater efficiency in the handling of freight, particularly fresh fruits, melons and vegetables and livestock. In addition, failures which result in delay are watched closely and eliminated, while delay due to errors of employees in billing, carding, diversions, etc., have been minimized. A more careful inspection of cars has overcome, to a large extent, delay resulting from setting out bad order cars for repairs or transfer. Loss and damage resulting from defective and unfit equipment was reduced from $80,897 in 1921 to $6,763 in 1929, due to a general improvement in the condition of equipment.

Selection and Preparation of Cars Helpful

Care in the selection and preparation of cars for the specific commodity to be loaded has also contributed very materially to the results. The use of inspection forms which specify the commodities for which the car is fit for loading has proved beneficial, for, in case of damage, specific defects are a matter of record. The larger part of the amount charged by this road to the selection and preparation of cars is on cars originating on other roads. In many cases the condition at destination is not such as to establish the fact that

Pictures Are Published in Employees' Magazine to Emphasize Leaky Roofs, Poor Containers and Defective Doors

the cars were not in proper condition at the time of loading.

There was a decrease in the item for loss of $79,084, or to $8,342. Of this amount, $54,570 was on less-than-carload business and $24,513 was on carload shipments. The reduction on the former is 97 per cent and on the later 79 per cent. Keeping freight under proper protection at all times is responsible for a large part of this saving. Warehouses and cars in yards, particularly those being unloaded on team tracks, are kept under close surveillance. Defective and broken seals are closely watched. Forms have been provided for reporting all irregularities discovered in connection with seals and each instance is investigated for the good of the service. Much credit is due the special officers for this reduction. Careful checking and good records have been of great benefit. The prompt investigation of shortages and overages has also been instrumental in effecting this economy.

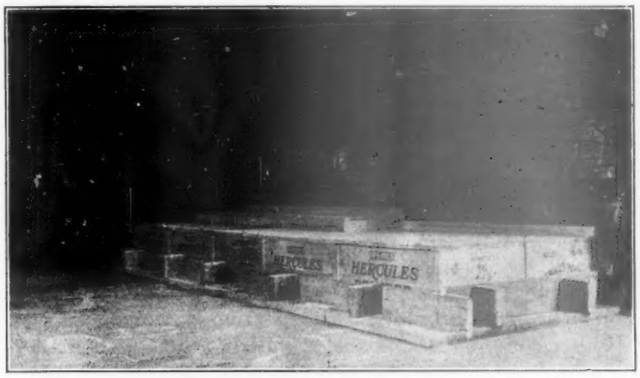
While there has been a reduction of $13,107, or from $54,591 to $41,483, in the item charged to damage, this cause has not responded to the efforts for improvement in the same degree as other causes and is by far the most serious problem. The great difficulty in eliminating damage is to determine the real cause. It is hard to determine definitely whether the damage is the result of poor containers or improper packing and, in the case of carload freight, whether it is improper loading or bracing.

A systematic drive has been conducted during the last few years to bring the handling of cars under better control and to overcome rough handling. The handling of cars in switching in yards has been watched closely. Instances of improper handling are called to the attention of the men at the time and the matter of careful handling in general is discussed with yardmasters, switchmen, trainmen and enginemen at every opportunity. The methods of handling, the layout of yards, the condition of tracks and, in fact, everything that retards the efficient handling of cars is reported for necessary attention. As an illustration, it was found that some of the tracks in one of the principal yards were uneven and the cars rolled faster on some than on others. The condition was promptly corrected. All excessive impacts registered by impact recorders are thoroughly investigated, and much good has been derived from discussions of rough handling at meetings, particularly the careful-handling meetings at the larger terminals. Instances of cars being cornered or sideswiped have been reduced to a low minimum. Generally speaking, all employees on this road, especially those in yard, train and engine service, are alive to the importance of handling cars carefully.

The principal difficulty encountered in handling cars is the necessity for speed to maintain the fast schedules of the day. In arranging schedules it is important that the time necessary for the careful and safe handling of cars, particularly in the making up and breaking up of trains, be taken into consideration. The men for the most part will do the work as nearly as possible in the way directed, but if it is necessary to rush, there is apt to be some rough handling.

63 Per Cent of Payments Charged By Other Lines

Unfortunately, there is no practical way of determining in dollars and cents how much improvement has really been accomplished by prevention work on this road because so many of the cars handled move over from two to as many as a dozen different roads without being opened in transit and claims are prorated on the basis of mileage. So far this year, 63 per cent of the total loss and damage account was charged this road by other roads. According to the decrease in bad order cars and the few cases of rough handling developed by impact recorder and direct observation, there has been, without doubt, considerably more improvement than is indicated by the figures. To obtain the maximum good,



Special Precautions Are Taken in Handling Powder

it will be necessary for all roads to co-operate to the fullest extent in improving the handling of cars.

The payments on fresh fruits, melons and vegetables are the highest, but even here there has been a marked reduction, as shown by the following comparisons:

	1929	1921
Number of cars	7,581	6,847
Revenue	$635,449	$658,980
Loss and damage	12,516	19,927
Ratio (in per cent)	1.97	3.02
Average payment per car	$1.65	$2.91

While loss and damage to fresh fruits, melons and vegetables was reduced 37 per cent, the decrease in the total loss and damage expense for all commodities was 80 per cent. Payments on fresh fruits, melons and vegetables represented 20 per cent of the total payments last year as compared with 6½ per cent in 1921. The average payment per car of fresh fruits, melons and vegetables is materially under the average for all roads reporting to the Freight Claim division of the American Railway Association. Some of the commodities on which claims of $500 or more were paid are listed below, with the average payment per car:

	K. C. S.	All Roads
Tomatoes	$7.74	$31.91
Watermelons	7.54	11.18
Irish potatoes	.62	1.91
Peaches	2.72	10.21
Apples	1.47	7.62
Strawberries	2.26	7.09
Cantaloupes	6.27	13.87

An allocation of payments on fresh fruits, melons and vegetables according to causes further reflects the results of prevention work. Payments due to improper refrigeration, ventilation or heater protection were reduced to $1,187 or 85 per cent in 1929 as compared with 1921, through educational work and a system of reports whereby all irregularities are investigated promptly. In addition, payments due to loss have been reduced 97 per cent, those due to delay 68 per cent and those due to other causes 53 per cent since 1921.

Payments resulting from damage to fresh fruits, melons and vegetables increased from $4,033 in 1921 to $9,239 in 1929, or to about 22 per cent of the total payments due to damage to all commodities. This increase of 129 per cent is less than the average increase of all roads. To reduce payments on fresh fruits, melons and vegetables, trained men are employed to inspect the products and oversee the loading. In addition, cars containing these commodities are given

specially careful handling. Crews switching cars during unloading are cautioned to determine whether the loads are properly broken down and to exercise every care in handling.

It is now generally recognized that a large proportion of the amount charged to damage because of broken packages is really due to failure to handle the broken packages so as to minimize the loss. It is estimated that the improper disposition of broken packages is responsible for 75 per cent of the expenditure. The large majority of broken packages can be recoopered without damage to contents and when this cannot be done the products can be repacked as well as possible and salvaged for a fair value. It is of vital importance to determine the real cause and extent of damage at the time of unloading, and efforts to have these features watched closely have been extended by this road for some time. Special forms calling for specific information have been provided for reporting damage.

Other commodities have responded to the efforts made by this road. The average payment per car of new furniture has been reduced from $13.89 in 1921 to $3.60 in 1929, the reasons for the decrease being improved methods of packing, crating and handling. A reduction of livestock payments from $3.79 per car to $2.96 is due to more care in handling and better service in general. In addition, better equipment is largely responsible for reducing flour and mill products payments from $2.22 per car to 44 cents per car and coal and coke settlements from 37 cents a car to 9 cents a car.

Sawtooth Trackage Saves Time in Switching Cars

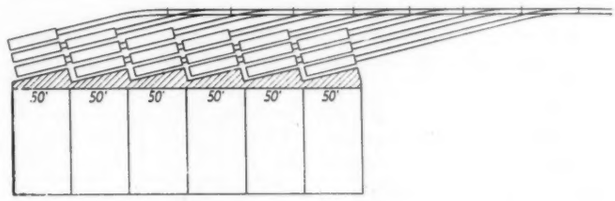
A NEW track plan for freighthouse and warehouse settings, which is designed to reduce or eliminate delays in switching, has been developed and patented by G. W. Hegel, chief engineer, Los Angeles Junction Railway, Los Angeles, Cal. The track arrangement differs from the usual layout in which a system of tracks is installed parallel to and continuous with the freighthouse. In the Sawtooth Trackage, as the new system is called, the tracks are of limited length and are constructed at such an angle with the building that the platform resembles the cutting edge of a saw.

Through the use of this plan, it is said that the amount of switching is reduced by 35 per cent and that the time required to switch out loaded or empty cars and place other equipment in the setting is reduced as much as 60 per cent, with an equivalent saving in the cost of doing the work. In addition, it is claimed that the saving in per diem through the ability to release cars from the setting at an earlier hour, is very large and will go far toward paying the slightly greater first cost of installation.

The diagram shows the basic principle of the plan, under which cars for particular destinations can be grouped on one or more tracks, thus permitting them to be removed for forwarding and replaced with empty equipment as soon as they are loaded, without disturbing the remainder of the setting or delaying the freighthouse operation. On the other hand, if it is an inbound movement, empty cars can be released and replaced with loads as soon as the unloading is completed, with the same facility as before.

Another advantage claimed for this plan is that end door loading is possible for one car on every track. The layout is not limited to the arrangement for spotting three cars at each door, but is so flexible that as many tracks as desired may be constructed. For every car added laterally, however, the capacity of each track is increased by one car, so that the most economical arrangement provides a capacity of from three to five cars for each track.

Under the present system of longitudinal tracks to serve freighthouses, warehouses, manufacturing plants, produce terminals and other similar facilities, there is always more or less congestion between 5 and 7 p. m. owing to the fact that large numbers of cars are rushed to the main freight yards for assembly into trains at factory-closing time. The further claim is made that much, if not all, of this congestion can be eliminated with sawtooth trackage, provided a system is in effect to collect the cars and move them to the yard from time to time during the day. By the grouping of cars for destinations, which was mentioned, it is said that less switching is required in making up the trains, it being possible in some cases to make up a train without extra switching as the cars are assembled to leave the freighthouse.



A Typical Installation of Sawtooth Trackage

If planking or some other form of road surface is installed to provide a driveway, the outside cars can be used as team track cars and unloaded into or loaded from trucks, if desired. Because of the limited number of cars on individual tracks, smaller power can be used in switching. For this reason also, it is said that there is less danger of injury to members of the switching crew, since they can do all of their work from the ground.

An installation of sawtooth trackage has been in service for two years, at the Los Angeles produce market, and it is said that the produce merchants and commission men like it very much, since it enables the switching crew assigned to this work to give prompt and frequent service without disturbing the main operation or shifting the contents of partly loaded or partly unloaded cars.

Plans for the installation of sawtooth trackage are prepared by the Sexton-Hegel Corporation, Los Angeles, Cal., and the right to install and operate the tracks is leased on a royalty basis.

Sawtooth Trackage at the Los Angeles Produce Terminal

Clearances Needed in Railroad Pension Financing

Discussion of the I. C. C. contractual requirement with suggestions as to possible action

By Hayes Robbins

PENSION trust funds and reserves will require at first so much more money than the present procedure of current annual payments that the first inclination of many executives is to dismiss the whole idea as beyond the limits of possibility. Confronted by the immediate financing problem, it is not surprising that some of them all but lose sight for the moment of the admittedly still higher cost of going on indefinitely piling up liabilities with no specific provision to meet them. But the day of reckoning is not escaped; it grows more difficult, more costly, the longer a sound financing program is postponed.

What Is Causing Delay?

The money it will take at the start to bring rising costs under control is not, of course, the only obstacle which is occasioning delay. There is the necessity, from the railroad viewpoint, of finding some way whereby pension funds, set apart and secured for ultimate pension requirements, can be kept at work meanwhile in the railroad industry. There is the problem of comparable accounting, as between roads on a funding and those on a non-funding basis. There is the very definite difficulty that the Interstate Commerce Commission has required that the roads must be under "contract" to pay pensions if they are to charge to operating expense account the appropriations they may make to trust funds and reserves, as they now charge their annual pension payments. And there is the element of uncertainty as to what the carriers would do, by way of definite action, even if this objectionable "contract" proviso were removed.

Which of these difficulties ranks first, or demands first solution, admits of plenty of argument.

The view is held in some quarters that there is no point in tackling the major problems of financing until and unless the charge to operating expense account is permitted under conditions regarded as practicable.

In other words, the roads hesitate to embark on the policy of "contracting" to pay pensions, understanding that by this is meant contracts with employees or employee associations. The Commission's ruling of November 23, 1928, provides that operating expense account shall be charged with amounts paid into trust funds or for purchase of annuities to meet pension liabilities assumed by steam roads which have "definitely undertaken by contract to pay pensions."

The ruling apparently clears up one point, at any rate. Pension trust funds need not necessarily be charged against surplus. The argument for such charge in respect to liabilities already accrued has been that the operating expense account in past years has benefitted by the failure to charge against it the necessary reserves to provide for currently accruing pension liabilities.

As a matter of fact, had the carriers actually attempted to set up such reserves they could not have charged them to operating expense account, since permission to do so had not been accorded. They have maintained that it is neither just nor in the public interest to require now the deduction of these large sums from surplus, with possible impairment of a carrier's credit as well as the value of securities purchased by present investors, to provide for liabilities which the managements had no power to meet through operating expense accounts in the past.

But obviously, under the ruling of November 23, 1928, the Commission does not take the position that pension liabilities incurred from now on must be provided for from surplus. On the contrary, roads pensioning under "contract" are specifically required to charge appropriations for trust funds or annuities to operating expense. The inference is logical that such charge is in itself legitimate and a proper method of absorbing pension fund costs. Why, then, was the "contractual" condition embodied?

The understood purpose was to make certain that funds set apart to meet each year's pension liabilities assumed—and charged into that year's operating expenses—would be used for, and only for, the purpose designated. Presumably it was assumed that if the roads were under contract with employees, to pay pensions, they could not subsequently divert such funds to some other object for which approval would not have been given as a charge to operating expense account.

The real question thus becomes, whether this proposed "contractual" proviso is necessary to assure the designated use of trust funds against any possibility of diversion. Can other provisions be established, of equal or greater certainty and without the practical difficulties of the "contract" idea?

Some of the Objections to the Proviso

Some of the reasons why the contract requirement would probably be an ineffective reliance for the purpose sought, and perhaps create more problems than it attempts to cure, are these:

(1) The contracts would be either with individual employees or some form of employee association. Their effectiveness for the Commission's understood object would lie in the power or the disposition, both or either, of the employee or the association to enforce them as against the carrier.

Individual employees are subject to discharge, resignation or death before pension retirement. Contracts with them might theoretically protect from diversion the reserves set up for their benefit, but something besides the contract would be necessary to assure this after they were off the pay-roll.

Employee associations would need to include, continuously, all prospective pension beneficiaries, in order to have the permanence and representative authority necessary for contracting upon matters extending many years into the future. Assuming that a compulsory membership policy could be carried out successfully in practice, as it conceivably might for new employees at least, it is highly problematical whether such an association could be relied upon for this particular function of enforcing its pension contracts with the employers of its own members. Such an association might or might not care to assume the responsibility and expense of legal controversy with a carrier relative to pension trust funds which the carrier itself had set apart. The Commission could not compel employee associations to take this action, nor could it be assured of the outcome in the courts. Its primary object would be very insecurely attained by contracts with employee associations.

If it is sought to remedy this latter weakness by providing for government intervention to enforce, on its own initiative, employee or employee association pension contracts, it becomes a question whether the government through the Commission could not with less complexity of procedure and greater certainty of result control the disposition of pension funds by its own regulatory powers over railroad accounting, irrespective of employee contracts.

(2) Presumably the Commission had in mind contracts of legally binding force. It has given no indication that it regards "moral effect" or "force of custom" as sufficiently assuring its objects in pension accounting. But a legally binding contract requires a bona fide consideration. It has not yet been made clear just what this consideration could be, on the employee side, other than pledges of personal service, which cannot be enforced, and which the employer itself could render of no effect by discharge of the man.

(3) Does a carrier which "definitely undertakes by contract to pay pensions" let itself in for a new and troublesome claim, in individual cases and possibly backed by organization, that the man holding one end of such contract has acquired a certain "right to his job" upon which the pension depends? There is such a possibility, to the extent at least of weakening discipline and hampering discharge for cause by this technical intervention. It is one of the "unknowns" which add to the reluctance of carriers to set a precedent of this kind.

(4) Another highly debatable question concerns the power of a board of directors to bind a carrier corporation for an indefinite period "by contract to pay pensions to employees when regularly retired for superannuation and/or disability?" It would seem that such contracts must be a continuing obligation, if they are to assure the Commission's aim to protect trust funds from diversion. They would reach many years into the future, in unknown amounts and under unknown conditions. This is a very different proposition from guaranteeing, through trusteeship or otherwise, that *whatever funds may be set apart* from time to time to meet future pension liabilities shall be used for the designated purpose and no other.

A Possible Alternative

An alternative to employee pension contracts has been proposed, and elaborated in considerable detail as to method, by one of the recognized leading authorities in railroad pension procedure. This is the establishment by the Commission of such accounting regulations applicable to pension trust funds and reserves as shall prevent their ultimate disbursement for any other than pension purposes. A properly adapted set-up of this kind should prove effective for the purpose, since the Commission's power to enforce, and to prevent evasions, would be at least as great as in the case of its other forms of accounting regulation. The technique of such a set-up is a subject in itself, but it would seem to present fewer practical difficulties and far greater effectiveness for the purpose than the dubious program of employee contracts.

How Could Pension Costs be Compared?

Apart entirely from this contract problem, we have the seeming difficulty in accounting that the charges reported by roads which decided to set up funds to cover the liability assumed with each year's pension grants would not be properly comparable, in the gross amounts, with those of roads which continued to appropriate only for pensions currently due.

This may not prove a sufficient reason for closing the subject, however. The methods of attaining uniform accounting, or approaching it as nearly as may be, are within the discretion of the Commission. It is not in the interest of the public, nor of the carriers or their employees, that new and sound developments in transportation policy should be defeated or indefinitely delayed by an inflexible rigidity of accounting requirements. Accounting is the indispensable accompaniment, but need not become a merely technical hindrance to wise and necessary forward steps in the solution of transportation problems.

As new situations arise, requiring new policies, methods can be and are found to display properly the relative effects in revenues and costs. Formal pension plans upon an actuarial basis present accounting problems peculiar to themselves. They may require special formulae in order to exhibit correctly the net financial result. For instance, the immediate aspect of appropriations to pension trust funds is a substantial increase in the annual expense account, if charged thereto, but the purpose and practical effect are to bring about a net reduction in pension expenditures as distributed over the period of years required for disbursement of the given appropriation with its earnings, to the pension grantees thereunder. It should be possible to work out a supplementary or coordinate exhibit of the annual disbursements from a given fund, actuarially estimated, which would be properly comparable with the annual pension payments of roads on a non-funding basis. Incidentally, this would serve also to reveal approximately the relative economy of the funding as against the non-funding method.

But the whole objection on uniform accounting grounds is really beside the point. The Commission's ruling of November 23, 1928, expressly opens the way to two distinct and concurrent forms of pension expenditure. It is not provided that trust funds if set up by some roads must be set up by all. Rather, it is required that such roads as elect to meet certain conditions not only may but *shall* charge appropriations for pension trust funds to operating expense. Necessarily, such roads would report pension expenditures on a basis different from that of roads which continue on a non-funding basis. The Commission could not have regarded the uniform accounting problem as in itself fatal to the possible funding operations of some but not all carriers.

Investing the Funds in the Industry

Undoubtedly, if a way can be found whereby pension trust funds can be kept at work in the railroad industry, while secured beyond question for pension purposes as

needed, it will do much to bring funding proposals within the range of the practicable, in the view of railroad managements. Few railroad financiers, in other words, approve the idea of detaching considerable sums to compound at say 4 per cent while they have to borrow for their own capital requirements at 5 per cent or 6 per cent.

If actual trusteed funds are to be set up, they must of course be invested somewhere, to earn the necessary interest accumulations. If invested in securities of the particular carrier which established the fund, the risk is obvious in the case of weak roads. Maximum security, and availability when needed, are prime requisites in any sound program of pension financing.

Certain interesting suggestions which may perhaps meet this difficulty, or go a long way towards meeting it, have been recently offered, but not in a form as yet available for detailed analysis. The problem is not by any means regarded as beyond solution, and it seems probable that the discussion of concrete proposals will be considerably advanced in the fairly near future.

When May We Expect Action?

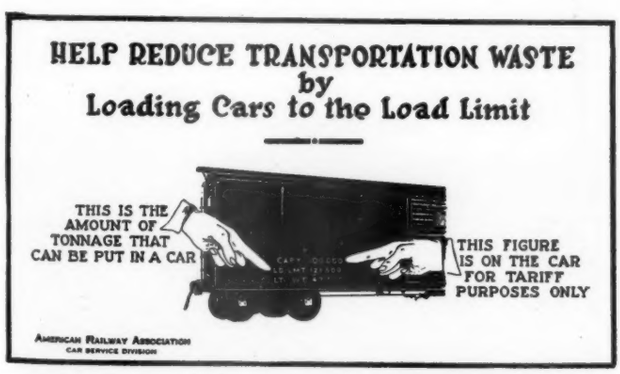
Getting back to the first obstacle cited, the "contractual" proviso, we have the question whether any considerable number of carriers would actually take steps to work out the remaining problems and set up pension funds, even if permitted to charge the appropriations to operating expense account without this objectionable requirement.

It may be suggested that the comparative inaction of most carriers thus far is not conclusive evidence of lack of interest in the funding method.

If they have not responded explicitly to inquiries on their probable attitude on funding proposals, it may be because of doubt as to precisely what the inquiries implied, or disinclination to commit themselves in advance of thorough investigation of what the proposed change would involve in each particular situation.

The re-casting of pension practice to a funding and reserve basis involves extensive personnel and actuarial studies, amply justified by the prospective results. But the inaction of most roads thus far may be largely due to their judgment that these investigations, as well as decisions on various incidental questions of policy, would be premature until authorization has been given to a financial procedure without conditions regarded as impracticable, unnecessary for the particular purpose, and beyond their corporate powers to meet.

* * *



Design Used on Blotter to be Distributed Among Shippers and Receivers of Freight and Railroad Employees by the Car Service Division, Showing Relation Between Load Limit and Nominal Capacity of a Freight Car Under Rule M.C.B. 86

True Price Trend of Crossties Analyzed

By William E. Oberle
Engineer Analyst, Philadelphia, Pa.

IN this article the writer will attempt to establish the true trend of the cost of crossties from 1914 to 1929 inclusive by the consideration of the records of a 27,000-mile carrier which traverses more than one-quarter of all the states in the union and which has a renewal and new work program requiring about five and a half million crossties annually. The rate of change in price or cost to this carrier for its crossties for the period mentioned was determined from the right-of-way or local purchase prices, for the reason that no element of bias or distortion is introduced in a price that is bare of additive elements, such as varying transportation or haul cost, etc., which accompany the price of foreign ties* delivered at many different points.

It is perhaps appropriate here to point out that one of the major difficulties in true cost analysis is to differentiate costs or prices between the date when the order or contract was placed and the delivery or shipping date. Many concerns allocate costs in their accounting in the yearly period when the goods are delivered, shipped or received. Suppose a contract or order is placed in 1928 and delivery made in 1929, for which the bookkeeping or accounting of the cost goes into the 1929 record, although the firm secured the advantage or disadvantage of the price level existing in 1928. If the price in 1928 was either higher or lower than in 1929, the firm's record of 1929 cost is correspondingly higher or lower than it should be and, therefore, the facts are distorted. This method may prove detrimental to financial or economic policy, particularly in times of large price changes, such as were experienced in the period covered in this study.

The Procedure

The first step in the study was to compile records showing the cost of each kind of tie for each calendar year in the period of the investigation, the ties being differentiated by the kind of wood and still further by grade. Taking the index 100 as the cost of each kind of tie in 1914, the prices for all the grades under each kind of wood were then cast together into one value for each year. Thus, a table was derived, which for any year between 1914 and 1929, gave the relative cost of the ties as compared to 1914, listed according to the kind of wood. This table follows:

Table I—Index or Relative Numbers

Calendar Years	Beech, Birch, Gums and Maples	Chestnut	White Oak	Sap and Red Oak and Mixed Oaks	Pine
1914.....	100.00	100.00	100.00	100.00	100.00
1915.....	100.00	100.00	100.00	100.00	100.00
1916.....	121.82	106.25	102.86	120.46	128.13
1917.....	145.23	124.15	117.14	154.56	153.15
1918.....	219.44	177.75	158.58	226.40	208.18
1919.....	268.08	235.00	202.30	294.60	352.59
1920.....	338.46	271.55	228.01	337.75	385.30
1921.....	302.61	263.85	231.44	331.53	315.83
1922.....	253.52	220.35	201.71	291.58	258.51
1923.....	263.42	205.00	183.44	278.23	270.07
1924.....	263.42	205.00	183.44	278.23	270.07
1925.....	279.45	217.50	192.01	285.05	288.82
1926.....	279.45	208.10	186.11	278.23	288.82
1927.....	265.73	190.00	174.87	278.23	247.56
1928.....	262.84	185.65	173.08	275.40	241.04
1929.....	257.58	177.50	169.72	270.05	228.81

In order to reduce the figures to one set of values so that a single curve of price trend could be plotted, it was necessary to average these relatives, and the heavy

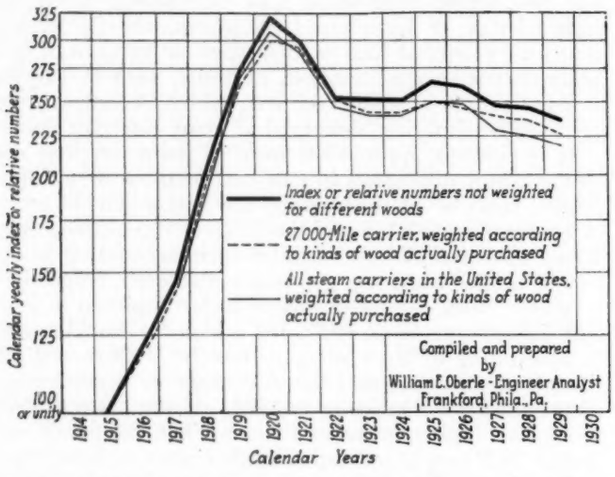
* This class of tie will probably show a greater increased rate of change than that of the right-of-way or local tie—a fact to be proved or disproved in a subsequent study now in progress.

line on the chart represents this. The next step was to determine the effect on the price trend of weighting the proportion of ties of each kind of wood to the total number of ties purchased. These proportions were obtained from the records of the carrier and are shown in the following table:

Table II

	Beech, Birch, Gums and Maples	Chestnut	Sap and Red Oak White Oak	Sap and Red Oak Mixed Oaks	Pine
1914	3.1 per cent	7.6 per cent	61.0 per cent	13.4 per cent	14.9 per cent
1926 to 1928, inc.	16.1 per cent	6.0 per cent	3.8 per cent	72.7 per cent	1.3 per cent
Arithmetic Average	9.6 per cent	6.8 per cent	32.4 per cent	43.1 per cent	8.1 per cent

These proportions were then applied to the relative values in Table I in order to give each kind of wood its correct weight in the final relative values for each



A Semi-Logarithmic Chart Showing the True Price Trend of Crossties from 1914 to 1929

year, showing the trend of the cost or price of ties during the period. These values are shown in the following table and are reflected in the broken line on the chart.

All Roads Considered

In an attempt to obtain a curve or true price trend, which would include the records of all the steam roads in the United States, recourse was had to the records of the Forest Service and of the Bureau of the Census of the Department of Commerce, in the form of the reports of the steam carriers on crossties purchased. These records account for 125 to 135 million ties purchased annually* and many woods other than those used in this article are listed. These include cedar, cypress, hemlock, fir, tamarack or larch and redwood, but in an aggregate such as we are dealing with, it is questionable whether, in view of the small percentages of these woods used for ties, their inclusion would materially affect the rate of change of the aggregate. Cedar would only be effective to the extent of about 2½ per cent, cypress about 4½ per cent, tamarack or larch about 2¼ per cent, hemlock about ¾ of 1 per cent and redwood about ½ of 1 per cent. However, fir, the third largest used wood, would be heavy in importance, averaging about 11¼ per cent, but in the writer's opinion the price of this wood in its rate of change would follow closely that of pine within the period of the investigation, so it can be discounted as materially affecting the trend. Most of these woods, unlike the ones we have used, are local in the area of their growth and in order to obtain a right-of-way or local price, the records of the carriers in each locality would have to be scanned. For instance, fir comes from the Pacific northwest, while redwood comes from the western part of the country and cypress from the southern part. The data giving the various average proportions of the different kinds of woods which were used were also obtained from government sources. With the data thus obtained, a procedure was followed similar to that for the specific carrier. The light line on the chart represents these values.

Table III

Calendar Years	Yearly Index or Relative Numbers	Percentage Rate of Change from Year to Year
1914	100.00	
1915	100.00	No change
1916	114.6	+14.6
1917	139.4	+21.6
1918	199.0	+42.8
1919	262.8	+32.1
1920	301.6	+14.8
1921	290.4	— 3.7
1922	251.3	—13.5
1923	240.4	— 4.3
1924	240.4	No change
1925	250.1	+ 4.0
1926	244.6	— 2.2
1927	235.1	— 3.9
1928	232.2	— 1.2
1929	227.0	— 2.2

* A total of 79,336,000 crossties were purchased by the Class I roads above during 1929. To this figure must be added the purchases of the Class II and Class III and terminal companies. This figure also reflects the decreasing requirements of recent years resulting from timber treatment.

Conclusions

One of the interesting facts fairly obvious from this data is the greater rate of change in the price of treatable woods as compared with untreatable woods, as brought out in Table I by comparing the change in the cost of white oak ties with that of other species. Many times the writer has heard that, because of wood preservation, a carrier could purchase much cheaper priced woods, the inference being naturally that it would thus save money in the cost of the raw or "in the white" ties. The total cost, including, of course, seasoning and treatment, supposedly is spread over the increased service life of a treated as compared with an untreated tie. Thus, the law of supply and demand is apparently being followed in the greatly increased use of treated ties and because of this it is questionable whether at present, when all factors are properly analyzed—considered from an operating standpoint—the carriers are not paying relatively close to what they did in the days before ties were treated.

* * *

Michigan Central Train No. 208 Southbound from Bay City, Mich.

Car Officers Meet in Detroit

Opening session addressed by T. C. Powell, president of the C. & E. I.—Association votes to change its name

THE annual fall convention of the Master Car Builders' & Supervisors' Association was held at the Book-Cadillac hotel, Detroit, Mich., August 26 to 28, inclusive. One of the most important actions taken was to change the name of the association. It consists of two former groups of car men united at St. Louis, Mo., in 1928. At that time, in order not to block the consolidation plans, certain concessions not satisfactory to all of the members were made regarding the name of the association. During the last session of the Detroit meeting the membership was unanimous in voting to re-adopt practically the identical name formerly held by the parent association. The word "Railway" has simply been dropped, and the association is now known as the "Car Department Officers' Association."

The total registration at the Detroit convention was 319, of whom 159 were railroad men and 78 supply men. Forty-two supply companies had representatives in attendance at the convention and participated in the exhibition of equipment and supplies. Following a brief address by President C. J. Wymer, superintendent of the car department, Chicago & Eastern Illinois, the feature of the opening session was a paper presented by T. C. Powell, president of the C. & E. I., who advanced many constructive suggestions regarding conditions which need correction in the interests of greater car department and general railway efficiency. Mr. Powell's paper, entitled "Stumbling Blocks," was so comprehensive that it cannot be published here in full, excerpts only being included.

Another paper of unusual interest was that by J. C. Scheidel, district superintendent of car repairs, North American Car Corporation, Tulsa, Okla., who discussed the means by which railroad mechanical departments can assist in improving the service rendered to private line car owners. L. R. Wink, representing W. E. Dunham, superintendent of the car department, Chicago & North Western, delivered a paper, outlining briefly the methods and advantages of systematic repairs to freight cars. C. R. Megee, district manager, A. R. A., Car Service Division, described the efforts of the division to increase the efficiency of car use and expressed appreciation for the co-operation received from car men, inspectors and shippers in his district. He stressed the importance of more accurate commodity carding in the interests of reduced cross haul and lessened switching expense.

W. S. Topping, assistant chief inspector, Bureau of Explosives, discussed the important subject of the safe handling of explosives and other materials, expressing the hope that the revised I. C. C. regulations, to be issued October 1, will prove an acceptable improvement over any preceding issue. For example, all of the principal rules affecting the carriers and their employees are segregated in a single section, No. 4, and can be much more readily located and studied by the employees.

E. Dahill, chief engineer, A. R. A. Freight Container Bureau, presented some interesting and highly-instructive moving pictures dealing with methods of loading cars to reduce damage in transit and resultant claims. W. A. Kuechenmeister, personnel manager, Dominion Forge & Stampings Co., Walkersville, Ont., delivered one of the most able addresses on safety first which has recently been presented before a body of railroad men. He demonstrated clearly that, in addition to all its other advantages, safety work is so closely allied with production efforts that, when railroad men have taken all of the steps necessary in the interests of maximum safety, they have thereby done the very things essential to produce the highest unit output. An individual paper on air brakes was presented by C. R. Childs, air brake supervisor, New York, Chicago & St. Louis, Cleveland, Ohio, and one on the relations between the car and the stores departments by F. E. Cheshire, general car inspector, Missouri Pacific, St. Louis, Mo.

Committee reports included one on wheel failures, Chairman W. J. McClennan, general shop inspector, New York Central; elimination of oil and grease spots from box car floors, Chairman F. J. Swanson, district master car builder, Chicago, Milwaukee, St. Paul & Pacific, Minneapolis, Minn.; elimination of damage to automobile car floors, Chairman M. J. Mills, master car builder, Pere Marquette, Detroit, Mich.; A. R. A. interchange rules, Chairman M. E. Fitgerald, general car inspector, Chicago & Eastern Illinois, Danville, Ill.; A. R. A. billing, Chairman E. S. Swift, chief A. R. A. clerk, Wabash, Decatur, Ill.

Election of Officers

At a regular meeting on the last day of the convention, the following officers were elected for the ensuing year: President, K. F. Nystrom, superintendent of the car department, Chicago, Milwaukee, St. Paul & Pacific, Milwaukee, Wis.; first vice-president, F. A. Starr, superintendent of reclamation, Chesapeake & Ohio, Huntington, W. Va.; second vice-president, E. J. Robertson, superintendent of the car department, Soo Line, Minneapolis, Minn.; third vice-president, C. J. Nelson, chief interchange inspector, Chicago Car Interchange Bureau, Chicago; fourth vice-president, A. J. Krueger, master car builder, New York, Chicago & St. Louis, Cleveland, Ohio. A. S. Sternberg, master car builder, Belt Railway of Chicago, was re-elected secretary-treasurer.

The retiring president, C. J. Wymer, superintendent of the car department, Chicago & Eastern Illinois, Danville, Ill., automatically became chairman of the board of directors. Other members of the board, including six new members just elected are as follows: F. H. Becherer, assistant superintendent of motive power and equipment, Central Railroad of New Jersey, Jersey City, N. J.; R. J. Overton, general foreman of car repairs, Southern, Spencer, N. C.; D. E. Bell, A. R. A. instructor, Canadian National, Winnipeg, Man., Can.; P. Kass, superintendent of the car department, Chicago, Rock Island & Pacific, Chicago; G. D. Minter, district car inspector, Norfolk & Western, Portsmouth, Ohio; J. P. Egan, superintendent of car inspection and maintenance, New York, New Haven & Hartford, New

Haven, Conn.; J. S. Ackworth, mechanical superintendent, General American Tank Car Corporation, Chicago; E. S. Smith, master car builder, Florida East Coast, St. Augustine, Fla.; T. J. O'Donnell, chief interchange inspector, Buffalo, N. Y.

The exhibition of equipment and supplies this year was provided under the direction of the Supply Men's Association with President J. T. Cralley, Union Metal Products Company, Chicago, in general charge. New officers of the Supply Men's Association were elected for the ensuing year, as follows: President, C. F. Weil, American Brake Shoe & Foundry Company, Chicago; first vice-president, E. H. Hall, Milar Clinch & Co., St. Louis, Mo.; second vice-president, K. M. Hamilton, The Bettendorf Company, Chicago; third vice-president, Karl Milar, Milar Clinch & Co., Chicago; fourth vice-president E. H. Weaver, Westinghouse Air Brake Company, Chicago; secretary-treasurer, Bradley S. Johnson, W. H. Miner, Inc., Chicago. Directors of the Supply Men's Association include: F. E. Dodge, National Lead Company, Chicago; J. H. Schroeder, Union Metal Products Company, Chicago; J. W. Fogg, MacLean-Fogg Lock Nut Company, Chicago; R. J. Miner, W. H. Miner, Inc., Chicago; C. V. Broadley, American Steel Foundries, Chicago; E. H. Mattingley, Standard Auto-Tite Joints Company; E. E. Thulin, The Duff-Norton Manufacturing Company, Chicago; A. G. Dohm, Camel Company, Chicago; W. C. Saunders, Timken Roller Bearing Company, Canton, Ohio.

Stumbling Blocks

By T. C. Powell

President, Chicago & Eastern Illinois

Other departments of a railroad sometimes refer in rather disparaging terms to the activities and especially to the ingenuity of the traffic representatives; failing, however, to comprehend that the traffic solicitors are the men in the trenches who should be supported with the last ounce of energy of every other department. For let me assure you that many times the traffic department activities are necessary in order to compensate for some error in the maintenance, construction or design of equipment for which another department of the railroad is responsible. I put maintenance first in this list only because it is always with you—design and construction are fundamentally more important because more lasting. I shall discuss some of the faults which have become "stumbling-blocks" in the way of successful traffic solicitation.

This year has been a very anxious one. Railroad forces have been reduced to cut down expenses, and one of the first departments to feel the loss of traffic is the car department. It is to your personal interest to attract favorable attention to the railroads, not only to your own road but to every railroad as against other competitors. If all the traffic that is now being handled by the automobiles, motor coaches and trucks could be turned back to the steam railroads I don't believe there would be any doubt that even now every railroad would be fully occupied even if deprived of the freight and passenger traffic created by the development of the automobile.

Passenger Car Insulation and Ventilation Requirements

One of the trunk lines operating from St. Louis to Boston lost two passengers the other day because these parties said they would "rather be hot in an automobile than hot in a train." I don't know how many more are affected in the same way, but I venture to say a great many. Let me say that I am advised of the experiments now being made in the direction of cooling dining cars and sleepers, and I am told that the apparatus is successful in reducing the temperature; but is a special and costly apparatus necessary to set up and maintain a certain definite and constant ventilation of a passenger train car? Is it not possible for the designers of passenger cars to take cognizance of the great advance that has been made in ventilation and insulation in the last 15 years?

When the steel passenger car was forced upon and adopted by the railroads, it was immediately realized that a steel car became hotter and retained the heat longer than the wooden car. Everyone knew that wood was a better insulator than steel, but what general effort was made or is made now to utilize the present day discoveries to overcome the non-insulating properties of steel sheets?

Is it a credit to the railroads for an article recently published in the Scientific American, to start off with the following assertion: *"Summer rail travel is rendered uncomfortable by heat, dust, cinders, smoke and noise"*? Is it not your particular responsibility to at least mitigate these conditions if you cannot remove them entirely? Is not such a statement by an established journal a "stumbling-block" to the traffic departments of the railroads trying to encourage summer traffic by rail?

Within the last ten years new forms of insulation, some natural and some artificial, have been put on the market. In the same period, some of the principles of soundproofing have been discovered. It is impossible to *prevent* all noises, but it has been found possible to reduce the reverberation and repetition of noises, so that we now have sound-absorbing ceilings and walls of various forms. Further invention and progress has been going on but it is not noticeable in railroad circles.

Given a car that is properly insulated against heat, cold and noise, what can be done in the way of ventilation to make it more comfortable for the passenger? No one willingly raises a window and endures the discomfort and obstruction of a wire screen except to get a breath of fresher or cooler air that is otherwise not available.

I always associate South Africa with a hot atmosphere, yet I am told that oranges and other fruits are transported by the South African Railways in ventilated cars over distances up to 1,500 miles, then put into steamers and are delivered in England and continental countries with a comparatively small amount of damage. If this is possible with ventilated freight cars, why cannot something be done with the passenger train cars?

To my own knowledge, railroads in France and Great Britain and all automobile companies are providing windows of sheet glass which can be opened and closed easily; and as the object of opening a railroad car window is to obtain fresh or cool air, or both, why cannot this function be combined with ease of operation, coupled with a device that will keep out the dust, which now seems inseparable from high speed trains?

If we examine the cars intended for human occupation, we find that many of them are provided with circular fans in the ceiling or with bladed fans at either or both ends of the car. Evidently opinion is divided as to which device is better; but there can be no divi-

sion of opinion that any operation or arrangement of the ventilating system which results in there being forced down upon the head and shoulders of the passenger a volume of overheated air, accumulated while the car was standing still or while it is in motion, should be corrected. Such a condition is a "stumbling-block" to the traffic department and a menace to the payroll of your department.

Refrigerator, Stock and Coal Cars

The same general questions of insulation are involved in designing a refrigerator car as in planning a passenger train car but with the further responsibility of taking care of inanimate freight which cannot move from a cold corner to a warmer spot in the car to avoid damage.

If certain modern insulating materials applied to a building will reduce the cost of fuel 50 per cent as compared to an uninsulated building and to a less extent as compared with certain other insulating materials or those sold as such, it follows that a well-designed and constructed refrigerator car, properly maintained, will largely reduce the danger of freezing to the contents.

Some years ago, the department of agriculture carried on very extensive experiments and recommended certain specifications, but all refrigerator cars have not been modernized; and so I have seen claims filed for damage to vegetables on the allegation that less than two hours' delay from normal schedules on a journey of over a thousand miles in a falling temperature caused the contents near the floor and walls to freeze even though the minimum outside temperature was not below eight degrees below zero. I have said enough on insulation to let you know what I think to be the cause and remedy of this particular "stumbling-block."

When one of the important classes of traffic of the railroads was live stock, stock cars were of various types and sizes. They were found useful for cord wood, cross ties, some classes of lumber, barreled goods and even watermelons, and every variation in the length and width of these cars interfered to some extent with their availability for such miscellaneous freight.

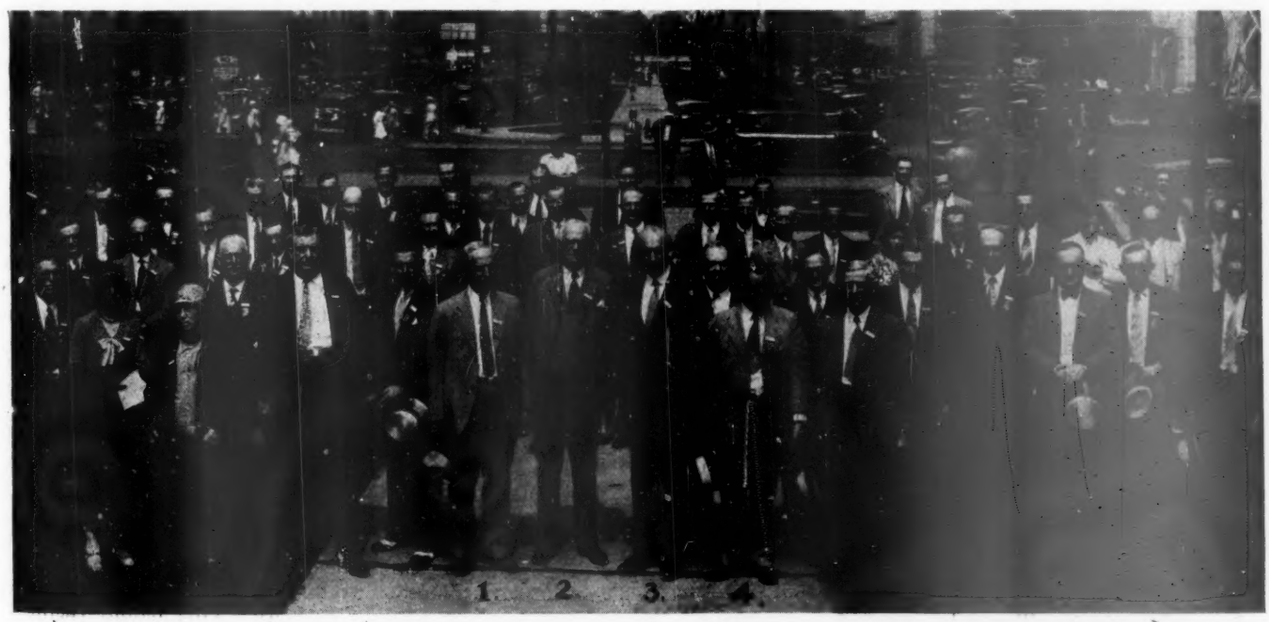
Four years ago, to avoid renting equipment, we decided to build some stock cars and undertook to find out whether there was such a thing as a standard stock car. There was not! But in 1928, when most of the live stock for distances within 100 miles and perhaps further was being carried by motor truck, that is to say by tractor and trailer capable of handling cattle in lots of twenty and hogs in lots of 100, as well as by farmers' trucks, the mechanical division of the A. R. A. did adopt standard dimensions for a stock car. As Shakespeare said, "What do they in the north, when they should serve their sovereign in the west?"—*Richard III.*

The only thing I shall say about coal cars is that those which are equipped with hoppers are in some cases so designed that many of them leak fine coal, sand, etc., and the claims on that account raise another "stumbling-block" for the traffic department.

Box Cars Not Standardized in Practice

In the box car we have the greatest container for valuable freight. Poems have been written about the box car but no one has yet done justice to it.

Let me remind you that for several years, and particularly since the war, the Department of Commerce has been conferring with manufacturers as to the best way to standardize packing cases, crates, baskets, boxes, and, in fact, containers of all kinds. But the biggest container of all, the railroad box car, has not been standardized in actual practice. Please don't jump to the conclusion that I have overlooked your conferences and discussions, your tentative plans and final recommendations, but I thought I would test the standard dimensions with actual practice, so I have obtained from the different car building companies in the United States reports showing the inside dimensions of cars constructed under orders in the 10 years from 1920 to 1929, inclusive. To prevent any possibility of hurting the feelings of any particular railroad, I asked them to omit any reference to the purchaser of the cars and



Group of Officers and Members of the M. C. B. & S. Association in Convention at Detroit, Mich.

In the center foreground are (1) C. J. Wymer (C. & E. I.), president; (2) F. W. Brazier (N. Y. C.), an honored guest; (3) K. F. Nystrom (C. M. St. P. & P.), first vice-president; (4) F. A. Starr (C. & O.), second vice-president, and (5) A. S. Sternberg (Belt Railway of Chicago), secretary-treasurer.

to give me only the inside dimensions and approximate date of delivery.

These separate reports have been combined into several different exhibits (not published here for lack of space). No doubt, there was justification in some cases for variations, but nevertheless, I think you will be surprised at the ingenuity displayed in departing from the standard specifications.

In 1923, the railroads adopted certain recommended dimensions for the standard single-sheathed box car, including the outside dimensions, and which resulted in the following inside car dimensions: Inside width, 8 ft. 6 in.; inside height, 8 ft. 6 in.; inside length, 40 ft. 6 in.

In 1925, the railroads adopted the recommended dimensions and specifications for the standard double-sheathed box car, including the outside dimensions, and which resulted in the following inside dimensions: inside width 8 ft. 7¾ in.; inside height 8 ft. 6 in.; inside length 40 ft. 6 in.

The only difference between the two as to the inside dimensions is in the width, the recommended specifications for the standard double-sheathed box car having resulted in an inside width 1¾ in. greater than the inside width of the standard single-sheathed box car.

Statement of Total Box and Automobile Cars Constructed by Years and Indicating the Wide Variation from Standard Box Car Dimensions

Year	Total No. of box cars constructed	Total No. of box cars built to single sheath std. dimensions*	Total No. of auto cars constructed	Grand total
1920	7,763	.....	550	8,313
1921	4,751	.....	.....	4,751
1922	27,717	2,000	14,410	42,127
1923	22,446	2,000	14,825	37,271
1924	28,725	1,200	12,750	41,475
1925	29,248	2,800	12,832	42,080
1926	17,426	4,027	8,892	26,318
1927	8,690	570	8,120	16,810
1928	10,932	800	4,300	15,232
1929	19,606	304	16,814	36,420
1930	15,165	300	10,050	25,215
Total	192,469	14,001	103,543	296,012

Per cent of total box cars which were constructed to standard dimensions ..... 7.17 per cent

Number of different dimensions specified in orders	(Box) 114	(Auto) 114 Total 228
Minimum length	(Box) 31 ft. 5¼ in.	(Auto) 35 ft. 9½ in.
Maximum length	(Box) 49 ft. ⅜ in.	(Auto) 50 ft. 8⅜ in.
Minimum width	(Box) 7 ft. 5⅜ in.	(Auto) 8 ft. 1 in.
Maximum width	(Box) 9 ft. 5 in.	(Auto) 9 ft. 3 in.
Minimum height	(Box) 6 ft. 0 in.	(Auto) 7 ft. 6 in.
Maximum height	(Box) 10 ft. 2½ in.	(Auto) 10 ft. 6½ in.

* 40 ft. 6 in. by 8 ft. 6 in. by 8 ft. 6 in. No double-sheath box cars were built, 1920 to 1930, inclusive, to standard dimensions, 40 ft. 6 in. by 8 ft. 7¼ in. by 8 ft. 6 in.

Perhaps this difference was accidental but it may be worth pointing out that no car has been constructed in the last ten years on these exact inside dimension specifications.

From the report to which I have referred, I find that in 1922 cars less than 36 ft. long and less than 8 ft. 6 in. wide were constructed. Commencing in 1920, a number of orders for cars 36 ft. long were placed, with dimensions which varied from 8 ft. 6 in. to 8 ft. 9 in. inside width and 8 ft. ¼ in. to 8 ft. 7⅞ in. high.

As late as 1922, and 1923, 2,000 cars were built of the following dimensions: 36 ft. ½ in. long; 8 ft. 6⅛ in. wide; 7 ft. 8 in. high. In 1921 and as late as 1929, some cars were built just under 40 ft. long, the height ranging from 8 ft. ½ in. high to 8 ft. 7 5/16 in. high.

Please bear in mind that Rule 34 provides that fractions of an inch will not be counted in computing the length of cars; also that the increases in the minimum weights to be charged for commence with "cars over 36 ft. 6 in." long and range up to "cars 50 ft. 6 in." in length.

You will see from this that a car that is 39 ft. 10⅛ in. long costs the shipper the same as if it had been 40 ft. 6 in. long. The shipper probably gets no actual use out of the 4⅛ in. extra length, whereas he might get some use out of an extra foot in length without paying any more for it.

One would suppose that a car 50 ft. 6 in. long was the extreme length necessary to accommodate the public, but in 1930 one order has been filled in which the cars measure 50 ft. 8⅜ in. long inside, 8 ft. 1 in. wide and 10 ft. high, with double doors. The curious thing is that many of the cars which measure 50 ft. 6 in. long inside otherwise range in width from 9 ft. to 9 ft. 3 in., whereas this particular car is only 8 ft. 1 in. wide and thus has less cubic capacity than the other 50 ft. 6 in. cars referred to.

Use of Non-Standard Car Penalized

The carrier who constructs a car of an odd length is probably paying for the experiment, and you can also see that there being no continuity or harmony of purpose in ordering cars for these varying dimensions, the classifications under Rule 34 become more and more complicated and there is more and more excuse for appealing to the Commission for further concessions.

I will not take your time to recite the items that come under Rule 34, but I can say that in a list furnished me by Mr. Fyfe, chairman of the Consolidated Classification Committee, I find something over 8,000 different items, each one of which is affected by irregularity in the dimensions of box cars.

Some commodities may be loaded conveniently in a car 40 ft. 6 in. long but require a greater width than 8 ft. 6 in., or a greater height than 8 ft. 6 in. If every car measured only 8 ft. 6 in. in width and height, the shipper would accommodate himself to that. The variations that I have referred to above are sufficient to justify him in asking for the particular car of which he can make the greatest use.

What I want to emphasize is that the members of the traffic department look upon freight and passenger cars as conveyors or containers for revenue traffic. They feel that the best combined judgment should be exercised in providing the best container for the purpose. A car which because of its design or lack of consistent design increases the cost to a shipper or increases the cost of handling on a foreign railroad or which causes unnecessary and profitless empty haul "is worse than a crime; it is a blunder."

In other words, it may be said that every item of car construction which interferes with the easy loading or unloading of freight, the safety of the freight itself or, in the case of passengers, with the comfort of a passenger is a "stumbling-block" in the way of a traffic solicitor in his approach to the public.

I don't suppose there is a perfect freight car in existence, except, perhaps, the one designed by each particular road, but if we could take the dimensions that would be most acceptable to all shippers I believe that all railroads could use the resulting car. Certainly all roads are now using every kind of box car in creation, and many roads are partners in special cars, having still different dimensions, such as refrigerators. With absolute uniform and fixed inside box car dimensions, every manufacturer of any kind of container would naturally adjust his product to the box car loading capacity. This would result in simplified package handling machinery and probably lead to less damage in transit. It would give better loading

and save in demurrage, and what would be useful in the long run, obsolete cars which are costly to maintain and are a menace to safety would be penalized.

Co-relate Box and Refrigerator Car Capacities

In my first reference to the refrigerator cars, I spoke particularly as to the insulation and the function of the refrigerator car in protecting the contents against the outside temperature, but I have in mind another feature and that is the capacity of a refrigerator car with relation to the capacity of the standard box car and in connection with the handling of merchandise freight of a character which will not injure the refrigerator car and conversely will not be injured by the refrigerator car.

If there could be established a definite relation between the inside dimensions and the cubical capacity of a standard box car, on the one hand, and the inside dimensions and the cubical capacity of a standard refrigerator car, on the other hand, there could also be established a corresponding relationship as to the minimum weights.

There is always a large empty movement of refrigerator cars and there is frequently, at the same time and in the same direction, a movement of loaded box cars. A comparatively small increase in the number of refrigerator cars, loaded in the reverse direction would operate to reduce the empty movement of the standard box car as at present.

Damage in Transit—Draft Gear Deficiencies

Some tonnage has gone from the railroads to the trucks because owners think there is less delay by truck. What other causes are there? In addition to the different dimensions to which I have referred, why do not the car doors close in such a way that they are water tight, particularly in a hard rain storm while the freight train is in motion? If rounded edges of certain interior parts of the car reduce damage, why are not these timbers always rounded? Why is it necessary to impose upon the shipper the burden of covering these sharp corners with additional material? In building the inside lining of the car or putting in the nailing strips, why are not the edges of the upper boards always beveled or rounded so as to reduce the possibility of chafing. Some one has thought of these things before and someone has adopted the remedies but perhaps they were thought to be "personal peculiarities" and not worth following up. I took occasion to examine a car of watermelons the other day which came through in good condition and largely because the shippers had protected the melons against the ventilators, designed and installed so as to cut the melons if unprotected. All these are "stumbling-blocks" in the way of the traffic department.

I do not intend to discuss the exhaustive draft gear tests now being carried on, under the auspices of the railroads themselves, and I know very well that certain items are reserved by managements for the final decision. I think, however, that our own experience may be of some interest. In our investigation of some of the claims for alleged "rough handling" it was rather alarming to find that in many cases the draft gear was of an obsolete type, that is, of a type no longer made nor advertised. The alarm arises from the conviction that a car so equipped will always be running amuck among cars of good character, and perhaps manufacturing a claim on each trip, thus becoming a vicious "stumbling-block."

For instance, in checking eight cars recently reported to contain damaged freight, it was found that on four of these cars, that is, 50 per cent of the eight cars taken haphazard from the record of one week, the draft gears were of such obsolete type!

Again, some months ago in carrying on the same investigation we found one car equipped with a draft gear that had not been advertised by the original maker for 18 years. One damage claim, and as a matter of fact the particular damage claim in question, would have paid for a modern gear.

I will not undertake to say upon whose shoulders rests the responsibility for any condition of this kind. My theme today is "stumbling-blocks", but I do not believe there is any connection between the present investigation which is going on, and the *preservation* of devices so out of date that even the maker does not think it worth while to urge their purchase and use.

Traffic may be deflected from a railroad and to some other form of transportation by almost any kind of negligence that results in claims, and this effect is not always limited to the particular road at fault. People in this country do not stay in one place all their lives; they move from one point to another, and sometimes back again, so that the impressions acquired in one place may be carried to an entirely different section and, therefore, the disability of one road may influence the prosperity of others.

A few items in which claims are involved may properly be called "stumbling-blocks" to the traffic department and may divert freight not perhaps to another railroad but to one of the competitors of all the railroads are: (a) Refrigerator cars not fully insulated; (b) defective draft gears, the effect of which may sometimes be defined as "rough handling"; (c) leaky roofs; (d) car doors badly designed, resulting in damage while in transit; (e) sharp corners among the inside members which might easily be rounded.

If you have listened to these remarks, I know very well what is in the mind of nearly every man in the room, and that is that if the management of his particular company would allow him to spend enough money he would show the world how freight cars and passenger train cars should be designed, built and maintained. Therefore, I make a slight reference to shop equipment.

In the same issue of *Railway Age* in which I saw my name in print as being on this program, there was an editorial which was headed "Why Neglect the Car Shops?" I confess that I would find it hard to answer this question.

May I not, as President Wilson would have said, suggest that as individual officials you may have been reluctant to suggest expenditures in this direction, knowing as you do that every railroad company, including your own, has many places in which money might be spent to advantage? To put it in another way, perhaps the car department has been too modest and hasn't shouted loud enough for help.

There are several old proverbs floating around. One of these is, "A good workman doesn't complain of his tools." This probably originated in the mind of some owner to forestall a request for an expenditure, and perhaps it has prevented intelligent suggestions.

My view is that manufacturers are anxious to build tools to suit the railroads and that railroads should not depend on the manufacturers for all the ideas. I contend that car department officers should find out what kind of a tool or machine or device or gadget is needed to turn out the best kind of work for the car department and then insist upon that tool or machine being built. If it is the best for that purpose there will be plenty of demand for it.

And now a word about your organization. I know that you have the knowledge; I know that you have the skill, and that you appreciate the needs, and I, therefore, with confidence, leave to the members of this great organiza-

tion the task of removing all the "stumbling-blocks" within your control from the path of the traffic department.

Every railroad is interested in preventing and removing "stumbling-blocks" in the way of securing traffic, not necessarily in the case of one railroad against another railroad but fundamentally in the case of all railroads against all other means of transportation.

My own opinion is that in the next five years there will be, with the assistance of your association, a very substantial improvement in the passenger and freight train cars of this country, and I am, therefore, looking to you to help win back to the steam and electric railroads a substantial portion of the traffic that otherwise would seek competing channels.

Accident Investigations

THE Interstate Commerce Commission has issued three documents which presumably complete its publication of investigations of train accidents for the year 1929:

(1) Condensed reports of investigations for October, November and December (Quarterly Bulletin No. 42).

(2) Full report, illustrated, dated April 12, of derailment due to high speed at Glen Mary, Tenn., on November 11, 1929. (This is also abstracted in Bulletin 42.)

(3) Full report, illustrated, dated May 7, of derailment at Angola, La., due to loose tire, on September 14, 1929.

Of the 35 reports of collisions and derailments covered by Bulletin 42, abstracts have been printed in the *Railway Age* as follows:

July 5, 1930, page 26, thirteen reports (October).
July 19, 1930, page 121, nine reports (November).
July 26, 1930, page 156, six reports (December).
November 16, 1929, page 1157, Portage, Pa., (October 9).
December 21, 1929, page 1440, Lick Branch, W. Va., (November 1).

The other five cases are given below, together with the Angola report, which belongs in the preceding quarter.

Bulletin 42 contains also a table showing all accidents investigated in the calendar year, with brief statement of cause.

The Whole Crew Forgot

Chicago Great Western, West Platte, Mo., October 28.—A work train consisting of a locomotive and 29 cars, moving eastward at low speed, collided with westbound freight train No. 91, also moving very slowly. The engineman of the work train was killed and one other employee was injured. All members of the crew of the work train overlooked the superior train, and the surviving members admitted that they had completely forgotten about it. The collision occurred within yard limits. The report says that for 30 days prior to October 28 the number of trains operating over this line averaged about 14 a day, and "had an adequate block system been in use the collision probably would not have occurred."

Missouri Pacific, Oxford, Kan., November 8.—Eastbound passenger train No. 314 moving at about 35 miles an hour, was derailed by a broken rail and the locomotive was overturned. The engineman was killed and three employees were injured. The inspector concluded that the rail had been broken prior to the arrival of this train, and there was evidence that the rail had been damaged by the stroke of a spike maul. The rail was of 56 lb. section and was laid in 1887. It was but little displaced at the time of the derailment and was left in the track for a whole day. The track was found to be in bad condition generally.

Southern, Glen Mary, Tenn., November 11, 1:30 a. m.—Northbound passenger train No. 2 consisting of locomotive No. 6472 and 13 cars, moving at high speed, was derailed on a curve of 5 deg., 15 min., and the locomotive was overturned and fell down a bank, rolling completely over and a considerable distance on the second revolution. It was followed by the tender and the mail car. The second car continued on the roadbed about 900 ft. and the next six coaches came to rest in a zigzag formation. A tree 15 in. in diameter was struck and moved several feet without being overturned. This accident was investigated by James E. Howard, engineer-physicist, who concluded that excessive speed was the cause of the derailment. The engineman was reputed very careful and the deduction is that he experienced a temporary lapse of consciousness immediately preceding the derailment. This report was issued by the commission in pamphlet form with numerous illustrations.

Cleveland, Cincinnati, Chicago & St. Louis, Dix, Ind., November 23.—Westbound passenger train No. 5, moving at about 35 miles an hour, ran past two cautionary signals and a stop signal and collided with an eastbound locomotive which had been nearly or quite stopped. The engineman of the passenger train was killed and 31 passengers and four employees were injured. Smoke and steam from a standing locomotive had perhaps obscured the home signal; and therefore it was incumbent upon the engineman to bring the speed of the train under control, but it appears that he made no attempt to do so.

Chicago & North Western, Pecatonica, Ill., December 2.—Eastbound stock train, extra 1154, standing at the station, was run into at the rear by eastbound third-class freight train No. 738, and three drovers were injured. The conductor of 1154 had left the rear part of his train standing on the main track while engaged in taking on additional cars, and the caboose remained in this situation for about 55 minutes. More time had elapsed than he thought, and he said he had intended to put out a flag before No. 738 was due. Blame is placed both on this conductor and on the approaching engineman.

A Delayed September Report

Louisiana & Arkansas, Angola, La., September 14.—Northbound passenger train No. 4, moving at from 25 to 35 miles an hour, was derailed because of a loose tire on the left front truck wheel of the locomotive. The locomotive was overturned and one car fell down a bank. Six passengers and four employees were injured, the latter including the engineman, who subsequently died. This derailment was investigated by James E. Howard, engineer-physicist, who found that the looseness of the tire had been of long standing but had not been reported. The tire had been subjected to frequent hammer tests but without revealing its true condition. He believes that the abraded surface of the inside face of the tire should have attracted early attention; and he doubts whether the hammer test was capable of detecting this fault. This report was issued by the commission in pamphlet form with numerous illustrations.

Weight Transfer Compensation for Electric Locomotives

Change of connections makes it possible to proportion torque on the two axles of a truck to compensate for shift of weight caused by torque

By W. R. Taliaferro

Railway Equipment Engineer, Westinghouse Electric & Manufacturing Company

IN all self propelled vehicles while being propelled by their driving units there is a transfer of weight between axles of such a magnitude that a vehicle with its total weight perfectly equalized between its axles while standing or coasting, may have its weight decidedly unbalanced between axles when operating under power.

In the case of locomotives this effect is great enough to reduce the maximum tractive effort 15 per cent on some types.

Probably the worst offenders among the electric locomotives are the two-axle single-truck and the four-axle double-truck types having driving motors geared to each axle. In these types, the effect of weight transfer is manifested by the slipping of the leading wheels of the single two-axle truck locomotive and the slipping of the leading wheels of each truck of the double-truck type of locomotive.

The diagram shows the forces acting to cause weight transfer in a truck of a two-truck locomotive due to motor reactions, the chief cause of weight transfer. Motor *A* is supported on the bolster *C* and on the No. 1 driving axle. When the armature revolves or attempts to revolve in the direction indicated, the torque tending to rotate the axle through the gearing has an equal reaction tending to rotate the motor frame in the opposite direction, thus reducing the total weight on the axle as indicated by the force *F* and introducing an equal force *G* on the bolster *C*.

Motor *B* is supported on the bolster *C* and the No. 2 driving axle and when working has a reaction opposite to that of Motor *A* due to its being mounted ahead of the axle for the direction of motion shown; thus Motor *B* causes a reduction of weight on the bolster *C* indicated by the force *G* and an increase in the weight on the No. 2 axle as indicated by the force *F*.

The forces *G* and *G'* on the bolster form a couple

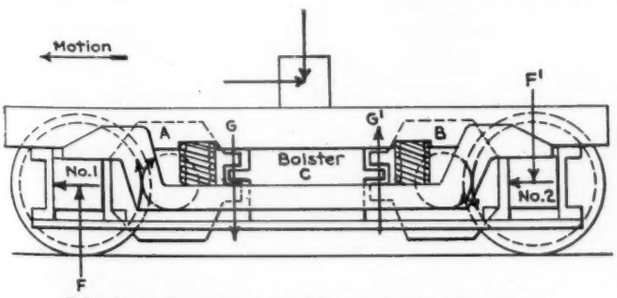


Diagram Showing the Forces Acting to Cause Weight Transfer

Weight Transfer Compensation Is Used to Good Advantage on the 100-ton Switching and Transfer Locomotives Used by the Illinois Central in the Chicago District

which tends to increase the load on the leading axle and decrease the load on the trailing axle.

In addition to the above forces, the horizontal thrust of the axles against the journals and the equal and opposite reaction at the draw-bar set up a couple that tends to lift the front end of the locomotive and load the rear end.

If all the above forces, namely the motor forces directly on the axles, the reactions on the bolster and the effect of draw-bar pull, are properly combined, the net result will be found to be a loss of weight on the leading axle of each truck and a gain on the trailing axle of each truck.

It is apparent that as more and more tractive force is exerted by motors *"A"* and *"B"* as the locomotive attempts to start a train which has more friction than the locomotive can overcome, more and more weight will be subtracted from the leading axles and added to the trailing axles until the point is reached where the leading wheels of one or both trucks will spin. The trailing wheels will not spin since they have an excess of weight on them and hence have increased adhesion under this condition.

It is obvious that if the tractive effort of the leading wheels could be decreased and that of the trailing wheels increased to the point where each set of wheels exerts a tractive force proportional to the weight on

them when exerting the maximum tractive force, this tractive force would be greater than before and theoretically all wheels should spin when the slipping point of the wheels is reached.

It is comparatively easy in principle to obtain such an unbalance in tractive force between the motors in each truck, especially in the first or series motor combination by simply operating the leading motors in each truck in short field and the trailing motors in full field.

In this case, the armature current of all motors is the same but the field ampere-turns of the leading motor or motors are greatly reduced, which in turn reduces the tractive force delivered at the leading wheels.

Tests on a 100-ton locomotive equipped for weight transfer compensation provided the following comparison of the same locomotive with and without weight transfer compensation at the slipping point of the wheels on clean dry rails and without sand:

Adhesion without weight transfer compensation	30 per cent
Adhesion with weight transfer compensation	35 per cent
Increase in tractive force and adhesion	16.6 per cent
Increase in current	22 per cent

On the above basis, a locomotive weighing 100-tons, equipped for weight transfer compensation, is capable of starting a train that would require a locomotive weighing 116.6 tons not so equipped.

While it is possible to arrange the locomotive control to obtain weight transfer compensation on every start, this is not thought advisable since it increases the power demand of the locomotive while starting trains small enough to be handled without the use of this feature. Therefore it is advisable to arrange for weight transfer compensation to be obtained manually by pressing a button or by connecting the control of this feature to the sander switches.

With the weight transfer control circuits connected to the sander switches, weight transfer compensation is obtained automatically whenever the sanders are in use, and since the sanders are normally used when the rail is bad or the train heavy, the simultaneous use of these two aids for obtaining maximum tractive effort is desirable.

THE GERMAN STATE RAILWAYS have developed a new type of train for handling express packages, in order to compete with highway transportation, according to Department of Commerce reports. These "light freight" trains consist of a locomotive and two cars. Easy movement from one car to another is facilitated by a vestibule similar to that used on Pullman cars. The cars are well lighted and heated and provide facilities for performing certain clerical work (preparing and filing freight bills, etc). Their usual speed is 65 to 75 kilometers (40 to 46 miles) per hour.

* * *

On the Missouri Pacific Near California, Mo.

Drafto Units for Blowing Locomotives

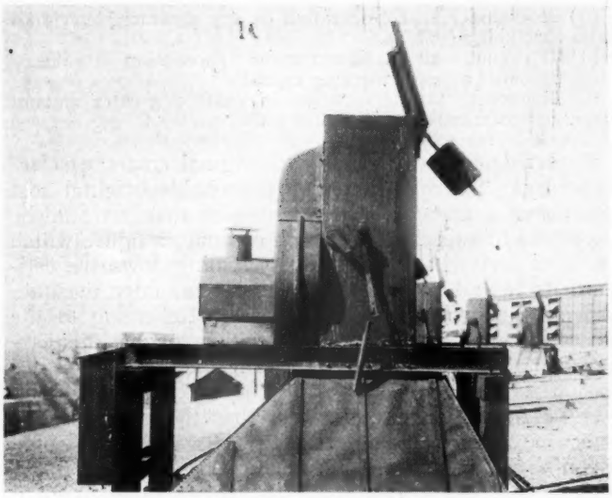
AFTER several years of experimental work with service installations, an improved, self-contained, electric-driven blower, known as the Drafto Unit, has been developed by the Locomotive Forced Draft Company, Minneapolis, Minn., for use in enginehouses to provide the draft required for firing up locomotives. The first unit of this general type was installed in the Minneapolis enginehouse of the Great Northern in 1925 and, since that time, 33 additional units have been installed at important terminals on the road.

The Drafto Unit consists of a motor-driven fan mounted on an iron frame on the enginehouse roof and arranged to induce a draft in the roof stack which is transmitted through a suitable hinged, telescoping sheet metal duct to the locomotive stack. A counterweighted inclined runway serves as the raising and lowering mechanism, being actuated by the stack of the locomotive as it comes into or passes out of the house. Draft control is provided by means of automatic dampers.

The electric motor for the Drafto Unit is rated at 7½ hp. and operates at 1,800 r.p.m. The fan, especially designed for the work, is 35 in. in diameter and comprises cast steel spiders and suitable blades mounted in a cast iron housing. The telescoping smoke duct is made of No. 8 Armco iron, the inner sleeve being approximately 19 in. in diameter and the outer one 21 in. Suitable guides and supports are provided for the inclined runway. Drafto Units are designed to furnish sufficient draft for firing up any standard locomotive, bringing the water from a temperature of 180 deg. F. to steam at 75 lb. pressure in approximately 50 min. with an energy consumption of about 5 kw. hr. If operated with the firebox door open for hot work, the energy consumption averages approximately 6 kw. per hour.

The Drafto blower, as at present constructed, consists of a motor-driven unit, as shown in the illustrations. The method of operation is as follows: As a locomotive enters the house, its smoke stack engages the stack guide and raises the stack hood and inner telescoping sleeve until it enters the hood and the locomotive is "spotted" in the usual way. The construction of the unit is such that raising the stack hood six inches opens a quick-acting damper on the top of the unit, giving a path for the smoke and gases direct to the atmosphere. If it is planned to have the locomotive in the stall for any length of time before it is needed again, the damper on top of the unit may be closed by hand operation and kept in this position until the draft is required for hot work or firing. When the fire is laid and ready for lighting, the fan is started and the fire lighted.

In firing up a locomotive with these units, better results are said to be obtained if the fire is made as light as possible and given frequent attention by the hostler to keep it thin and the grate covered. No special care is required in backing out the locomotive. As it leaves the house, the hood of the Drafto Unit follows the locomotive stack until the former reaches its limit. The stack then follows the stack guide, the telescoping sleeves, stack hood and guide automatically returning to the lowest position, ready to receive the next locomotive. Locomotives of a difference in height of 2½ ft. can be accommodated under this device, and

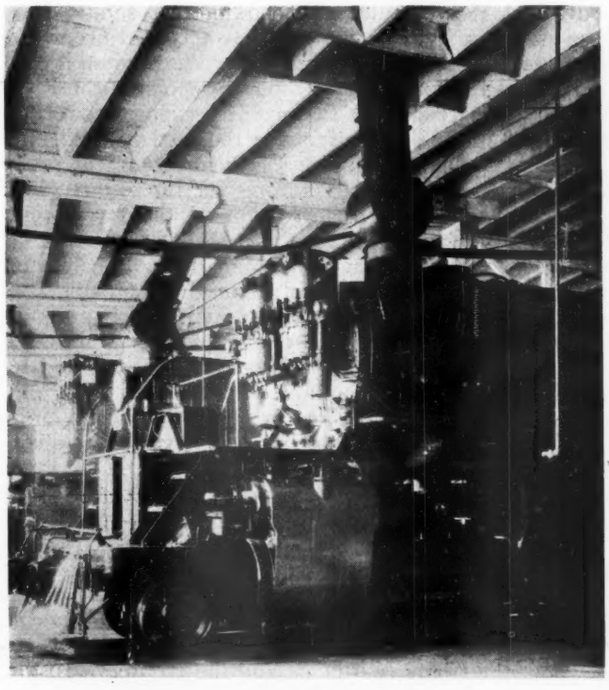


Details of Drafto Unit Equipment as Applied on an Enginehouse Roof

3½ ft. in either direction from the center of the unit is available for spotting.

Tests with Steam Blowers

Many tests have been made with the Drafto Unit in regular operation and with steam blowers in order that comparisons could be made. Tests with two types of steam blowers in use by one railroad are said to have shown a consumption of steam of 2,400 lb. on the smaller unit and 3,400 lb. on the larger one, per hour. On 760 locomotives entering the experimental Drafto Unit, an average time of one hour for firing and hot work has been shown, 49 minutes of which was for firing and 11 minutes for hot work. Tests made with a steam blower to determine the amount of air taken from the enginehouse through the smoke jack are said to have shown an outflow of 12,000 to 15,000 cu. ft. of air per min. when the blower was operating, and from 5,000 to 6,000 cu. ft. of air leaving the house through the smoke jack even with no blower in use. The design of the Drafto Unit prevents this waste and consequently simplifies the problem of heating.



View Showing Smoke Duct Connection to the Locomotive Stack

The advantages claimed for Drafto Units may be summarized as follows:

First: A direct saving for each locomotive fired of approximately the difference between six kw. hr. of electric power at 2 cents per kw. hr. with Drafto Units, and 1,500 lb. of steam at 60 cents per 1,000 lb. with the steam blower.

Second: A variable but large saving in heating enginehouses in those sections of the country where heating is required.

Third: The elimination of smoke and gases from the enginehouse, with attendant improved working conditions and the possibility of retaining a better class of men in employment. With little smoke or gas in the enginehouse, the life of all metal parts will be extended.

Fourth: With the substitution of electric blowers for steam, it becomes possible to use the stationary boiler plant for heating only, enabling it to be closed down during the non-heating season, thereby effecting material economies in fuel and, particularly in labor.

Fifty-Fifty Weight For Reproduction Costs

By Harold F. Lane
Washington Editor, *Railway Age*
WASHINGTON, D. C.

THE Interstate Commerce Commission apparently is doing some experimenting with a plan for meeting the objections of the Supreme Court to the method of valuing railway property adopted by it in the O'Fallon case which may start another train of valuation litigation.

The court held in that case that the commission had failed to comply with the law of the land by not giving consideration to present or reproduction costs. Now the commission, through Division 1, is trying out on a number of short lines a method of valuation for recapture purposes which seems designed to give specific consideration to current reproduction costs, but without giving too much weight to them, and protests are already being sent in which treat the new method as just as illegal as the former one.

Whereas the commission formerly took the position that a valuation for rate-making purposes should approximate more closely the original investment in the property than the cost of replacing it at any given time, it has recently issued a number of "tentative recapture reports" which seem to be based mainly on an average of the cost of reproduction, less depreciation, and the probable original cost, also less depreciation, both, of course, being estimated.

In its O'Fallon report, which was condemned by the court, the commission said there was, in its judgment, "no intermediate process possible" for giving weight to the factor of current reproduction cost, "unless full weight be given under the current reproduction cost doctrine," which is "capable of being applied by any rule independent of the caprice of those who apply it." Now, although the commission has carefully refrained from stating that it is using a formula, valuation engineers and others whose business it is to study the

commission's valuation work think they have discovered in those that have been issued an "intermediate process" which gives 50 per cent weight to current reproduction costs and another 50 per cent to a depreciated estimate of the original cost. (The commission usually has reported it was unable to ascertain the actual original cost.) Some of them do not seem inclined to quarrel with any assertion that even this rule is entirely free from caprice.

Some time after the court's decision last year the commission began on what was described as a "vigorous campaign" of recapture proceedings, such work having been greatly delayed during the litigation over the methods used in the O'Fallon case. Pursuant to this campaign a large number of hearings have been held in the cases of short lines suspected of being in the recapture class, and during the past several weeks a number of tentative reports have been issued by Division 1 of the commission, covering a period of years since the transportation act was passed, in which valuations are found and net railway operating income ascertained, usually with many readjustments, for each year under consideration. It is understood that the smaller lines were selected for the first reports so that certain principles may be tried out in cases which involve less complications than those of the larger roads. The reports have been accompanied by a form of order allowing the carrier a period (40 days in some cases) in which to file a protest and directing the payment to the commission of one-half of the excess over 6 per cent found, the other half to be placed in a reserve fund. There is a proviso that the filing of a protest shall stay the operation of the order but unless protest is filed the report and order are to be considered "a final determination of the matters and things considered and reported herein." There have also been some proposed reports in recapture cases by Division 1 or by examiners which are not accompanied by orders and which will be subject to the filing of exceptions and to oral argument.

Valuation experts who have checked these reports have reached the conclusion that the final single sum value used is the product of a pre-conceived formula in which the depreciated original cost and the cost of reproduction less depreciation as of the various dates are estimated and to one-half of the sum of the two figures are added the present value of lands and the average property added during each year. This total is then rounded out and an allowance is added for materials and supplies. One protest filed states that the figure is rounded out to the nearest $500 while another states that its total was rounded out to the nearest $100.

Counsel for the Jonesboro, Lake City & Eastern have called attention to this formula in their statement of exceptions to the report proposed by an examiner, for the period before that property was acquired by the St. Louis-San Francisco in 1925. They refer to it as "apparently the product of a preconceived mathematical formula," and by way of demonstrating that this is so and "does not give consideration to all elements of value," a computation is submitted in accordance with such a formula which checks out exactly with the values proposed by the examiner for the various years. "That formula appears to be based," the statement says, "on the following erroneous principles:

(1) It gives only 50 per cent weight to cost of reproduction new at current prices.
(2) It gives less than 50 per cent weight to original cost or even *estimated probable original cost*, because it scales down the *probable original cost* by an arbitrary rule termed "estimated original cost depreciated," and gives only 50 per cent weight to that scaled down sum.
(3) It excludes all consideration of any separate element of value for "going concern."
(4) It excludes all consideration of appreciation in value.
(5) It omits all cash working capital.
(6) It deducts for depreciation in value a greater amount than the commission has permitted the carrier to accrue as a depreciation reserve."

Referring to the estimate of original cost the statement says: "If an estimate of a probable original cost is entitled to respect, it seems obvious that it would be erroneous to substitute for such estimate a figure which has been arrived at by arbitrarily scaling down the estimate itself and have the mutilated remainder masquerade as the probable original cost." Referring to the ascertainment of net railway operating income this carrier also insists upon a deduction therefrom for depreciation for each period for which a recapturable sum may be found, despite the fact that the commission's own accounting rules do not as yet make practical provision therefor, and that this depreciation be based on current cost of replacement, instead of upon original cost, in accordance with the decision of the Supreme Court in the United Railways case.

The Ironton Railroad in its protest also refers to the formula and objects to its use on the ground that the Supreme Court has held that each case must rest upon its special facts and that the same formula has apparently been used as to other carriers "although many of the elements of value in each case may have been very different." It asserts that the estimate of original cost is less than the true cost and it protests against the consideration of a depreciated original cost as "erroneous in principle and contrary to law."

Some of the reports deal with roads that have been abandoned and in one or two at least the commission has apparently been inspired by a desire to make its recapture claim before the assets were dissipated. Some apparently were selected because of certain principles involved on which the commission has readjusted the net railway operating income as reported by the carrier. One road reported its net income instead of the net railway operating income. The Supreme Court decision in the O'Fallon case said the district court had rightly ruled that no interest should have been imposed for any time prior to the final order, because not until then could the carrier know what, if anything, it had to pay. In a proposed report on the Richmond, Fredericksburg & Potomac the examiners recommended that, as the carrier was required to hold one-half of the excess as trustee for the United States, the commission require an accounting for interest received on such sums while in possession of the respondent. The tentative reports direct the payment of interest at 6 per cent on the amounts accruing from the date on which the principal amount is required to be paid.

In most of the reports the commission has found some recapturable income in one or two years although in others there have been substantial deficits. In the case of the Smoky Mountain no recapturable income was found for any year, but for the period from January 1 to April 14, 1927, just before the road was abandoned, the report found an excess of $3,097 above 6 per cent on the valuation, and ordered the company to pay $1,548 to the general railroad contingent fund.

Tentative recapture reports have been issued as to the Brimstone Railroad & Canal Company, the Smoky Mountain, the LaSalle & Bureau County, the Laurinburg & Southern, the Etna & Montrose, the Salem, Winona & Southern, the Louisville, New Albany & Corydon, the Glady & Alpena, and the Ironton. In the case of the Jonesboro, Lake City & Eastern and the Richmond, Fredericksburg & Potomac proposed reports by examiners were issued.

Block Signal Mileage, 1930

THE Interstate Commerce Commission has issued its regular annual tabulation, prepared by the Bureau of Safety, showing statistics of block signal mileage, etc., as of January 1, 1930. This information, though several months old, is made public four months earlier than it was last year. The preceding bulletin was noticed on page 1478 of the *Railway Age* of December 28, 1929.

This annual bulletin has grown to be a pamphlet of 19 pages. The data given when the records were begun in 1908 have been amplified so that today we have:

Table No. 1, Length of railroad block signaled, on each road.
Table No. 2, Kinds of automatic block signals.
Table No. 3, Methods and apparatus used with the manual block system.
Table No. 4, Practices in the operation of the manual block system.
Table No. 5, Same, continued.
Table No. 6, Automatic train control.
Table No. 7, Railroad grade crossings and gauntlets protected by automatic signals only, without interlocking.
Table No. 8, Centralized traffic control installations.
Table No. 9, Remote controlled power-operated switches and signals.
Table No. 10, Use of telephone in transmitting train orders.

A supplement to Table No. 2 shows the mileage, on each road, of disk signals (now only 119 miles exposed disk and 619 enclosed disk), and mileage of road on which visual cab signals are in service. This last now amounts to 3,481.6 miles (6,635.9 miles of track) on all of which the cab signals are a part of the automatic train control system, except on 47 miles of the Pennsylvania.

All of these tables, showing the facts for each individual road or system, gives the conditions on January 1, 1930. Copies of the pamphlet may be had from the Superintendent of Documents, Government Printing Office, at Washington, at ten cents each.

The net increase in length of railroad block signaled on January 1, 1930, as compared with one year before, was 1,375.3 miles, a much smaller increase than that of the preceding year; but the increase in *automatics* was 3,673.4 miles, which is 801 miles more than the increase in the year preceding. The decrease in manual block signaling now reported, 2,298.1 miles, is more than three times as great as that in the year preceding. Some of this decrease apparently is due to the abandonment of passenger train operation on minor lines, this record contemplating only lines regularly used for passenger service. There are cases where a road reports a diminution in non-automatic mileage greater than the increase in automatic mileage. The New York, New Haven & Hartford reports a total block signaled mileage about 500 miles greater than the total of passenger lines operated. The Pennsylvania has over 1000 miles, block signaled, not included in the tables, on lines used only for freight, or lines not required to be reported. Both of these roads report substantially 100 per cent of passenger lines signaled.

The aggregate total number of miles of road shown as signaled in this and the two preceding bulletins appears as follows:

	1930	1929	1928
Automatic	60,162.0	56,488.6	53,616.5
Non-Automatic	55,551.7	58,755.9	59,375.9
	115,713.7	115,244.5	112,992.4

The bulletin contains the usual table showing the principal increases and decreases in the year 1929, information which was given at length in the *Railway Age* annual review printed in the issue of January 4, 1930.

The length of road on which automatic train control was in operation on January 1, 1930, was 11,541.4 miles; total number of locomotives equipped 8,791; motor cars equipped 281.

Table No. 7 is not totaled as, in some or all cases, the same crossing is reported by two or more roads, but the number of roads appearing in the table is 44. The Chicago & North Western reports 16 crossings; Chicago, Milwaukee, St. Paul & Pacific 35; Chicago, Rock Island and Pacific 19; Great Northern 27; Minneapolis, St. Paul & Sault Ste. Marie 11; New York Central 12; Northern Pacific 11; St. Louis-San Francisco 12.

Table No. 8 contains 26 items on 14 roads; total miles of road 341.1; number of switches controlled 181.

Table No. 9, shows 48 roads; number of control points 376; number of switches 585.

Table 10 fills three pages, beginning with the Aberdeen & Rockfish and ending with the Youngstown & Northern; and presumably it contains all roads between these. The total length of road on which the telephone is used for train orders was 154,277 miles and the total operated mileage reported in the table is 246,905 miles. A number of roads report the use of both the telephone and the telegraph on the same section of road. There are 24 roads, of considerable length, on which the telegraph is still used exclusively for transmitting train orders.

More Wood Treated in 1929

DURING 1929, 362,009,047 cu. ft. of timber was subjected to preservative treatment, according to the statistics of wood preservation in the United States for 1929 prepared by R. K. Helphenstine, Jr., for the Forest Service, United States Department of Agriculture, in co-operation with the American Wood-Preservers' Association. The volume of wood treated in 1929 not only represents an increase of 26,088,668 cu. ft., or 8 per cent, over the volume treated in 1928, but comprises an increase of 16,323,243 cu. ft. over the volume treated in 1927, namely, 345,685,804 cu. ft., the previous high record. Railroad crossties have always comprised the great bulk of wood subjected to treatment and the total in 1929, 213,069,309 cu. ft., was an increase of 2,726,094 cu. ft. as compared with 1928. However, it showed a decrease of 9,626,211 cu. ft. as compared with the high record of 1927. The cubic feet of switch ties treated, 14,425,642 cu. ft., is slightly smaller than the total for 1928, but in all the other classes of material treated the volume in 1929 exceeded that for the previous year and in the case of piles, 17,126,794 cu. ft., poles, 77,154,317 cu. ft., and miscellaneous material, 11,219,613 cu. ft., the volume treated in 1929 exceeded that of any previous year.

Statement of Material Treated by Classes (Cu. Ft.)

	1929	1928	Increase
Crossties	213,069,309	210,343,215	2,726,094
Switch ties	14,425,642	14,533,450	107,808*
Piles	17,126,794	13,665,394	3,461,400
Poles	77,154,317	64,325,976	12,828,341
Wood blocks	6,852,130	3,676,312	3,175,818
Crossarms	1,957,431	1,207,512	749,919
Construction timbers	20,203,811	20,157,747	46,064
Miscellaneous materials	11,219,613	8,010,773	3,208,840
Total	362,009,047	335,920,379	26,088,668

* Decrease.

In 1929, the number of plants that were in active operation was 203, or 10 more than in 1928. During that year seven new plants were constructed, or three less than were built in 1928. Of the 203 plants 131 were of the pressure-cylinder type, 56 were non-pressure (open-tank) plants and 16 were equipped for both pressure and non-pressure treatment.

The consumption of creosote in 1929 by the wood-preserving industry of this country amounted to 226,374,227 gal., or 5,895,818 gal. more than in 1928. Of this total, 134,063,664 gal. was of domestic production

and 92,310,563 gal. was imported. This represents a slight increase in the amount of creosote imported and a small decrease in the use of domestic creosote. During 1929, also, there was a further increase in the use of petroleum, the total being 29,656,181 gal. as compared with 25,075,903 gal. in 1928, indicating an appreciable increase in the use of mixture treatment. The

Wood Preservation, 1909-1929—Together with Consumption of Creosote and Zinc Chloride

Year	Total Material Treated, Cu. Ft.	Number of Crossties Treated	Creosote Used, Gal.	Zinc Chloride Used, Lb.
1909	75,946,419	20,693,012	51,426,212	16,215,107
1910	100,074,144	26,155,677	63,266,271	16,802,532
1911	111,524,563	28,394,140	73,027,335	16,359,797
1912	125,981,056	32,394,336	83,666,490	20,751,711
1913	153,613,888	40,260,416	108,378,359	26,466,803
1914	159,582,639	43,846,987	79,334,606	27,212,259
1915	140,858,963	37,085,585	80,859,442	33,269,604
1916	150,522,982	37,469,368	90,404,749	26,746,577
1917	137,338,586	33,459,470	75,541,737	26,444,689
1918	122,612,890	30,609,209	52,776,386	31,101,111
1919	146,060,994	37,567,247	65,556,247	43,483,134
1920	173,309,505	44,987,532	68,757,508	49,717,929
1921	201,643,228	55,383,515	76,513,279	51,375,360
1922	166,620,347	41,316,474	86,321,389	29,868,639
1923	224,375,468	53,610,175	127,417,305	28,830,817
1924	268,583,235	62,632,710	157,305,358	33,208,675
1925	274,474,538	62,563,911	167,642,790	26,378,658
1926	289,322,079	62,654,538	185,733,180	24,777,020
1927	345,685,804	74,231,840	219,778,430	22,162,718
1928	335,920,379	70,114,405	220,478,409	23,524,340
1929	362,009,047	71,023,103	226,374,227	19,848,813

consumption of zinc chloride, 19,848,813 lb., as compared with 23,524,340 lb. in 1928, indicates a further decline in the use of zinc chloride for preservative purposes. The consumption in 1929 is the smallest in any year since 1911 and is less than half the consumption in 1920. In so far as it concerns the use of miscellaneous preservatives, there was a pronounced increase in the use of salts, 1,188,148 lb. in 1929 as compared with 443,308 lb. in 1928. The use of miscellaneous preservatives in liquid form, on the other hand, in 1929 was only 38,410 gal., or less than 10 per cent of the 417,953 gal. consumed in 1928.

From the standpoint of the quantity treated, oak ties again occupied first place with a total of 23,927,593 out of a grand total of 71,023,103 crossties, while southern pine with 17,570,311 and Douglas fir with 7,701,137 ranked second and third respectively. These three species constituted nearly 70 per cent of all crossties

Treatment of Miscellaneous Materials (ft. B. M.)

	1929	1928	1927
Lumber	87,972,030	64,426,979	53,567,458
Fence posts	10,904,180	7,272,422	23,439,193
Tie plugs	2,018,147	1,747,026	2,045,765
Car material	942,243	542,024	1,778,928
Crossing plank	273,588	1,460,463	419,541

treated in 1929. Fourth place was occupied by gum ties, of which 5,204,018 were treated. Next in order of number treated were beech, birch, maple and western yellow pine with quantities ranging from 2,788,687 for beech to 2,036,841 for western yellow pine.

In 1929, a total of 42,186,448 crossties or 59.4 per cent were treated with creosote; 18,515,738 ties were treated with creosote-petroleum mixture, and 8,612,276 crossties were treated with zinc chloride, a decrease of 1,879,560 from the number reported in 1928. In addition to the above, 1,628,297 crossties were treated in 1929 with creosote in mixture with zinc chloride and 80,344 with miscellaneous preservatives. Of all ties treated 69,929,128 were for use by steam railroads and 1,093,975 ties for electric railroad use.

The table of selected items taken from the tabulation of miscellaneous materials shows increases in all items except crossing planks. This table also shows that the volume of car material treated in 1929, namely, 942,243 ft. b.m., was nearly double the total in 1928, but little more than half the volume in 1927.

Looking Backward

Fifty Years Ago

The new bridge of the Chicago, Burlington & Quincy across the Missouri river at Plattsmouth, Neb., which was formally opened and tested on August 30, enables that road to enter Omaha, Neb., over its own line, making it independent of the Union Pacific at that point.—*Chicago Railway Review,* September 4, 1880.

The general commissioner of the Southern Railway and Steamship Association, in his annual report to that body, again recommends that the passenger business of the 56 roads which are members be placed under the control of the association. He states that if passenger traffic cannot be pooled rates can be enforced and violation of agreements punished. Passenger business in the South is small and unprofitable, and the loss in revenue in these fights over freight and passenger business costs each railroad much more money than can possibly be lost by an error in divisions of the business on full rates.—*Chicago Railway Review,* September 4, 1880.

Twenty-Five Years Ago

The Great Northern has named its fastest and best through passenger train between the Twin Cities and the Pacific Coast, the Oriental Limited. At the same time eight trains of eight cars each have been ordered, to improve the equipment on the train. Porters and dining car waiters on the train will be Japanese.—*Railroad Gazette,* September 8, 1905.

The shareholders of the Southern Pacific, a California company, on August 29 voted to approve the proposed increase of capital stock to $160,000,000 to provide for the consolidation of the constituent companies. The merger of this company with the Southern Pacific of Arizona and of New Mexico will include all Harriman lines between San Francisco, Cal., and El Paso, Tex., except the Central Pacific in California.—*Railway Age,* September 8, 1905.

Ten Years Ago

With the arrival of September 1 the railroads entered upon a new stage of their turbulent careers and are now operating upon their own resources, without the assistance of the government guaranty, but under a new level of rates intended to give them an opportunity to earn a net operating income equal to 6 per cent, in the aggregate, on the sum which the Interstate Commerce Commission has held for temporary purposes to be their value. It is roughly estimated that the amount which the government now owes the railroads, under its guaranty of one-half of a year's standard return for the period from March 1 to September 1, is approximately $600,000,000, less about $234,000,000 of advances already made.—*Railway Age,* September 3, 1920.

The railways of the United States are now breaking all records for the amount of freight moved at this time of year. The statistics for the week ended August 14 show that in that week the number of cars loaded was 962,352, which was an increase of 129,913 cars over the corresponding week of 1919, and an increase of 13,556 cars over the corresponding week of 1918. The freight moved in 1918 was a trifle more than in 1917 and these two years have heretofore held the record for the amount of business moved. Reports received by the Commission on Car Service show a gradual lifting of embargoes, and a restoration of normal switching service and generally no further necessity for rerouting freight to avoid places of congestion.—*Railway Age,* September 3, 1920.

New Books

Handbook of Culvert and Drainage Practice. 349 pages, illustrated, 4½ in. by 7 in. Bound in flexible imitation leather cover. Published by the Armco Culvert Manufacturers Association, Middletown, Ohio. Price $2.

This volume contains a large amount of engineering data on the design, location, installation and cost of culverts. Space is given to the tabulation of cost data covering the installation of culverts, and the determination of the sizes of culvert openings and of the proper length and location of culverts is discussed. Other matter includes an explanation of the jacking method of providing drainage openings, and liberal treatment is accorded the problem of sub-surface drainage, the book containing a chapter on the Railway Applications of Subdrainage. Types, causes and cures of landslides are discussed and the installation of corrugated metal pipe is explained. Tables in the back of the book furnish a large amount of valuable information.

Marks' Mechanical Engineers' Handbook.—Editor-in-Chief, Lionel S. Marks, professor of mechanical engineering, Harvard University. Published by the McGraw-Hill Book Company, Inc., 370 Seventh avenue, New York. 2,264 pages, 4½ in. by 7 in. Bound in leather. Price $7.

In accordance with the purpose of the first and second editions of the Mechanical Engineers' Handbook, Marks' third edition provides the mechanical engineer with the theory and data necessary to keep him abreast of current practice. Theoretical discussions have been strengthened and a new section added on the subject of vibration. Standards and practice have been brought up to 1930; physical data have been revised, and a number of new subjects, such as industrial combustion furnaces, electric furnaces and high- and low-pressure carbonization of coal, covered. The size of the book, which now represents the work of over seventy specialists, has been increased by about 270 pages. Thumb-tab and alphabetical indexes provide a ready reference to the thirty-three major topics covered in the sixteen sections of the book.

Ausgewaehlte Schweisskonstructionen, Band 1, Stahlbau (Selected Examples of Welding, Volume I, Steel Construction). Edited by Dipl.-Ing. Otto Bondy. 100 pages, 8½ in. by 11½ in. Bound in Cloth. Published by the VDI Verlag, Berlin, Germany. Price, 12 Reichsmarks.

This volume, issued under the auspices of the Verein Deutscher Ingenieure (Society of German Engineers) illustrates the uses of welding in building and bridge construction. It will be followed by other volumes dealing with welding in machine construction, in tank and pipe line work, in shipbuilding and other uses. The work, while printed in German, is nevertheless easily assimilable by the reader who does not read that language for the reason that the book is almost wholly pictorial—drawings and photographs being utilized to show the different applications, with a minimum of explanatory text. The book is bound in loose-leaf form, pages being printed upon one side of the sheet only. The examples chosen for illustration appear to have been carefully selected and the work makes readily available the standard practice in Germany for welding in steel and bridge construction.

Railroad Administration, by Ray Morris and William E. Hooper. 215 pages, 8½ in. by 5½ in. Bound in cloth. Published by D. Appleton & Co., New York. Price $3.50.

This well-known work by Mr. Morris, first published in 1910, now appears in a second edition "revised and largely rewritten" by Mr. Hooper. While in the work of revision Mr. Hooper found that the many developments in railroading during the past two decades called for a virtual rewriting of the first edition he nevertheless attempted "to preserve the spirit in which the original study was made and Mr. Morris' comments on fundamentals."

The general outline of the work remains practically the same with its initial chapters on the beginnings of a railroad and the organization of small and large lines. The first edition, however, included special chapters on "Divisional versus Departmental Organization," "Railroad Financial Organization" and "The Public Relations of a Railroad." The discussion of the former two of these subjects in the present book is mingled with descriptions of specific railway organizations while the improvement in railway public relations since 1910 no doubt eliminated any need for special treatment of the latter at the present time.

Other sections of the book, while brought up to date, remain basically the same and include a description of the duties of principal railway officers, a discussion of control of railway operations through statistical reports, and chapters on British railroad organization and types of government railway organization. Post-war railroad legislation in both the United States and Great Britain is also discussed while a final chapter considers the future of railroads and consolidations.

The many organization charts of American and foreign railroads which were a popular feature of the original work have been brought up to date and included once more throughout the book to form convenient graphic aids to the reader.

Toward Civilization, edited by Charles A. Beard. 307 pages, 8½ in. by 5½ in. Bound in cloth. Published by Longmans, Green & Co., New York. Price $3.00.

This compilation of essays by leading American scientists and engineers might be called the demurrer and its accompanying answer, filed by counsel for the "machine age," to the indictment drawn in "Whither Mankind." This latter, also edited by Dr. Beard, is described by him in the preface to the present volume as a work which "advanced the thesis that what is called Western Civilization, as distinguished from other cultures, is in reality a technological civilization, resting at bottom on science and machinery. In its pages this thesis was discussed and developed mainly by specialists in the humanities—law, economics and ethics. 'Outsiders looking in' reported their findings and impressions." "Whither Mankind," Dr. Beard continues, appeared to a group of prominent engineers in New York to be a challenge to their whole profession since it is their contention that "the real leaders of the machine age, men of scientific training and practical occupation, also recognize their responsibility for the future of humanity, see in the materials now at hand the promise of great advances for mankind, and are already seriously considering the drift of things and the nature of the readjustments necessary for a better future." Hence the technicians' day in court with "Toward Civilization" as their composite brief.

The chapters included in the book are: "The New Age and the New Man," by Ralph E. Flanders; "Science Lights the Torch," by Robert A. Millikan; "The Spirit of Invention in an Industrial Civilization," by Elmer A. Sperry; "Power," by C. F. Hirshfield; "Transportation," by Roy V. Wright; "Communication," by Lee de Forest; "Modern Industry and Management," by Dexter S. Kimball; "Agriculture," by Thomas D. Campbell; "Engineering in Government," by L. W. Wallace; "Art in the Market Place," by Richard F. Bach; "The Machine and Architecture," by Stephen F. Voorhees and Ralph T. Walker; "Work and Leisure," by Lillian M. Gilbreth; "Education and the New Age," by William E. Wickenden; "Machine Industry and Idealism," by Michael Pupin; "Spirit and Culture under the Machine," by Harvey N. Davis. Dr. Beard contributed the introduction and summary, the latter being entitled "The Planning of Civilization."

While the foregoing are all co-ordinated to the book's objective and thus combine to form a unified and connected treatise, the chapter of most interest to railroad men is that on "Transportation," by Roy V. Wright, managing editor of the *Railway Age* and editor of the Railway Mechanical Engineer.

Mr. Wright opens with a brief reference to the beginnings of transportation and the important role which its development has played in the advancement of civilization. From this he

turns to describe the present status of the various forms of transport—rail, marine, highway and air—and proceeds to an appraisal of each in the light of its contribution to the welfare of the nation. It is Mr. Wright's contention in this latter regard that "We have as yet failed to recognize the necessity of viewing the transportation problem as a whole. The overlapping of the various agencies of transport gives rise to a serious problem," the solution of which "must be based upon careful study made by qualified experts and on sound busjness and engineering principles."

To this faith in the evolution of engineering principles to aid in the solution of the current problem of transport co-ordination Mr. Wright later adds his tribute to past achievements of engineers in this field when he points out that they have "been largely responsible for the development of all forms of transportation." Coming to his concluding remarks where he considers the engineer in the broader sense, Mr. Wright finds that "because the engineer is coming to a larger conception of his responsibilities to public welfare and public service, he promises to be a not unimportant factor in the working out of a more even and equitable distribution of the good things of life to mankind generally." Because transportation is so essentially a public service and so fundamental and vital to modern civilization, he considers that engineers engaged in it should be "particularly equipped to be helpful in the larger aspects of the engineers' contribution to human welfare and progress—material and spiritual."

The Run of the Twentieth Century, by Edward Hungerford. 110 pages, illustrated, 6 in. by 9 in. Bound in paper. Published by the Publication Bureau, New York Central Lines, Room 1518, 466 Lexington Aveuue, New York, at the Du-Bois Press, Rochester, N. Y. Price 50 cents.

This volume is the story of a train—of a train that has become, as the author says, "very much more than a single train, a symbol of many trains . . . a national institution, as much as the Capitol at Washington or the Hudson river." Yet Mr. Hungerford's book is not merely the story of the Twentieth Century. It is also a record of the operations behind that train; "of the forces that work for the precision of its movement, for its comfort, for its safety."

In language that is thrilling and graphically vivid, but at the same time sufficiently non-technical to appeal to the layman, the author has here reproduced a record of the Century's daily run, together with all the infinite detail behind that operation. Starting at the point which is most familiar to the average passenger—the purchase of a ticket and the making of a reservation—Mr. Hungerford goes on to tell how the consist of each day's Century is made up at New York and Chicago, by the manager of passenger transportation and the terminal superintendent, always with due regard to the known number of reservations, weather conditions, etc. Then comes a description of the way in which the dining cars and various types of Pullmans for each section are chosen, cleaned, stocked with required supplies, and made into trains, all under the direction of the general yardmaster at Mott Haven on the east and Root street on the west. The daily departure of the Century—always with something of the dramatic about it—is next pictured, to be followed by the actual story of the run itself. The trip through the Grand Central yards, the change from electric to steam power at Harmon, the run up the Hudson and Mohawk valleys, across New York state and along Lake Erie, are all described in their proper order, with the arrival—again dramatic—at LaSalle Street station in Chicago reserved as a fitting climax.

To railroad men themselves, with first-hand knowledge of the things of which Mr. Hungerford writes, this volume will be interesting. To laymen, especially to those who have not fully outgrown an inevitable boyhood interest in railroading that has made them wonder, when riding on the Century, just what was happening behind the scenes, this same brochure, with its pen and wash drawings and diagrams of yards, stations and cars, should prove more than fascinating. It is, to be sure, excellent advertising for the New York Central, but advertising so well done that it is forgiven—though not forgotten—in reading of the pride and admiration, not to say awe, felt by the men who run this justly famous train.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Railroad Valuation, by Whitefoord R. Cole. "Standing as it does today, I have no hesitation in predicting that the valuation of the railroads of this country will never be completed. I have no hesitation in saying that, if you would concede that it would be completed, it will be obsolete long before it is completed." p. 21. Address before Association Traffic Clubs of America. 21 p. Publisher not given but probably available from Author, Louisville, Ky.

Telegraph and Cable Companies Year Ended December 31, 1929, compiled by Bureau of Statistics, Interstate Commerce Commission. "Selected financial and operating data from annual reports." Statement No. 30118 (File No. 7-A-2). 4 p. Issued by Interstate Commerce Commission, Washington, D. C. *Apply.*

Periodical Articles

The Division of Aeronautics of the Library of Congress, by Alfred F. Zahn. "In January, 1929, the Daniel Guggenheim Fund for the Promotion of Aeronautics proffered to Dr. Herbert Putnam its cooperation in forming at the Library of Congress an aeronautical collection which eventually might become 'the most important aeronautical library in this country, and perhaps even in the world.'" Brief description of the scope of the 9327 volumes making up the collection and the services available in assisting research. Mechanical Engineering, September 1930, p. 845-846.

The Economics of Port Development, by Sir George Buchanan. "For the purposes of this paper, I propose to define economics as 'the common sense way of doing what is best for the community at large, irrespective of vested interests, expediency and politics,' any one of which is frequently the negation of common sense." p. 442. "I suggest that efficiency would be best promoted by the observance of certain essential conditions, *viz:* (1) A railway port should first and foremost pay its way in working expenses, interest on capital, and sinking fund and not be regarded merely as an ancillary undertaking to the railway system, showing, in many cases, an annual deficit on its working . . ." etc. Discussion, p. 456-468. Journal of the Institute of Transport, July 1930, p. 442-468.

Economics of Railway Electrification, by R. B. Morton. "The electrification of steam railways in this country dates from 1895 . . . The cost of electrification construction has increased very considerably in the past 12 or 15 years, both as to labor and materials. Over all, this increase has probably amounted to at least 100 per cent. Obviously, the effect of this increased cost is to eliminate many an electrification project from the list of those which a few years ago would then have been economically justifiable . . ." p. 821, 822. Mechanical Engineering, September 1930, p. 821-826.

A Priceless Treasure of Business, by Edwin C. Hill. ". . . Professor Seligman accumulated piece by piece and item by item a library of 50,000 books, pamphlets, autograph letters, broadsides and even handbills which goes back to the very beginning of our literature on the history and practice of industry, commerce, and finance . . . it probably could not be duplicated over any number of years no matter how much money was made available for doing so. . . . It is now in Columbia's great library under the title, 'The Seligman Collection,' and as long as Columbia endures it will be at the service of young men and women whose minds turn to the field of economics. . . ." p. 33. Nation's Business, September 1930, p. 33-35, 164, 166.

Relation Between Rail and Waterway Transportation—Discussion, by Samuel O. Dunn. "'Economic justification' is an adequate reason for future waterway development in the United States; but in accepting this reason it would appear, first, that the term should be interpreted as a reduction in total National transportation costs; and, second, that it be supported not by belief, opinion, theory, or prophecy, but by facts and facts alone." p. 1739. Proceedings of the American Society of Civil Engineers, September 1930, Part I, p. 1729-1739.

Odds and Ends of Railroading

Historic Key

Upon the occasion of opening the new Cleveland Union Terminal, W. H. Sullivan, general superintendent of the New York Central, produced a relic that he prizes highly. It is an enormous brass key, six inches in length, that was used from 1866 to 1875 to lock the doors of the old lake front station, after the last train had pulled out for the night.

Five Generations of Railroaders

M. S. Rice, who retired on January 1, 1930, after 53 years' service on the Baltimore & Ohio, and 33 years as a conductor, is proud of his family's record. He married the daughter of a carpenter in B. & O. service. One daughter is married to a B. & O. engineman, the other to a conductor. His granddaughter is married to a B. & O. shopman, and, in addition, he has four sons in B. & O. train service.

A Non-Musical Elephant

Railways have been at one time or another charged with almost every crime on the statute books, but it remained for a French court in Paris to award damages to the owner of Mary, a trained elephant, for the loss of the animal's musical instinct following a train accident. The elephant's lawyer declared that Mary formerly was a tambourine, Barberry organ and trombone player and could dance the shimmy and tango.

Tunnel Record

SWISSVALE, PA.

TO THE EDITOR:

I notice you state in the issue of June 28 that 24 tunnels in a distance of 72 miles is just about the record. This gives an average of one tunnel for each three miles of track. On the Southern Pacific at Tehachapi mountain, there are 16 tunnels within 23½ miles, or a little better than one tunnel to 1½ miles of track, more than double the "record" mentioned, and even this may or may not be the record.

H. A. WALLACE,
Union Switch & Signal Company.

Whale to Soap!

Forty Frisco tank cars were called upon to handle an unusual commodity during May. The whale oil steamer Southern Princess arrived in Pensacola on May 7 from the whaling grounds in the Antarctic Ocean. Aboard she carried whale oil valued at more than $1,000,000, and dutiable, incidentally, at the rate of eight cents a gallon. The vessel is of the refinery type, and has compartments for hauling dead whales into the ship, where the reducing process is carried out. The forty tank cars of whale oil were shipped via Frisco Lines to Kansas City and Cincinnati, where the oil is used in the manufacture of soap.

A Slight Error

Mark Twain, in his book A Tramp Abroad, calls attention to an amusing error made by the London Times, 65 years ago. A cable was received from Australia in connection with the start of construction of the first railway in Queensland, from Maryborough to Gympie. Among other things the cable contained the following words: "Governor of Queensland, *twins first son.*" Accordingly, the Times printed the following: "Lady Kennedy, wife of Sir Arthur Kennedy, governor of Queensland, has given birth to twins, the eldest being a son." Eventually, this item came to the attention of Sir Arthur himself, and he let out a yelp that could be heard throughout the United Kingdom, for, as it happened, Sir Arthur was a bachelor. The horrified editors of the Times promptly investigated, and found that the cable should have read: "Governor of Queensland *turns first sod.*"

The First Sleeping Car Argument

K. D. Pulcipher, manager of publicity for the Pennsylvania, takes issue with W. E. Bell of the Canadian National as to the first sleeping car. He has written Mr. Bell the following letter:

"We have noted with interest your recent letter to the *Railway Age* concerning the construction and operation of the first sleeping car in America. You refer to the claim that Samuel Sharpe, when he was master mechanic and car builder of the Great Western Railway, invented a sleeping car which was subsequently built in 1857 and operated by the Great Western between the Niagara frontier and Detroit. This, of course, was before the first Pullman car came out. You will undoubtedly be interested to know that as a result of careful study and research, we have discovered that the first sleeping car in the United States was placed in service in 1837 on the Cumberland Valley Railroad between Chambersburg, Pa., and Harrisburg. This road is now part of the Pennsylvania and is known as the Cumberland Valley division. As soon as the Cumberland Valley was opened in 1837, its management recognized the need for sleeping car facilities between Chambersburg and Harrisburg to accommodate the large number of travelers from the west who arrived in the evening enroute to Philadelphia. We understand that quite a number of years ago the facts in regard to the construction and operation of these early sleeping cars on the Cumberland Valley proved to be the ruling evidence in a suit for an infringement of patent between the Pullman Company and the Wagner Company. In view of the foregoing, you will undoubtedly agree with us that the honor of building the first sleeping car in America unquestionably in all fairness must go to the officials of the old Cumberland Valley back in 1837."

A similar letter has been forwarded to Mr. Bell, with a copy to this office, by C. W. Garrett, statistician of the Pennsylvania.

H. T. Bentley, retired general superintendent of motive power and machinery, Chicago & North Western, also challenges Mr. Bell's statement. He encloses documentary evidence that a sleeping car was built for Queen Adelaide (consort of William IV) in London in 1843. Mr. Bentley says:

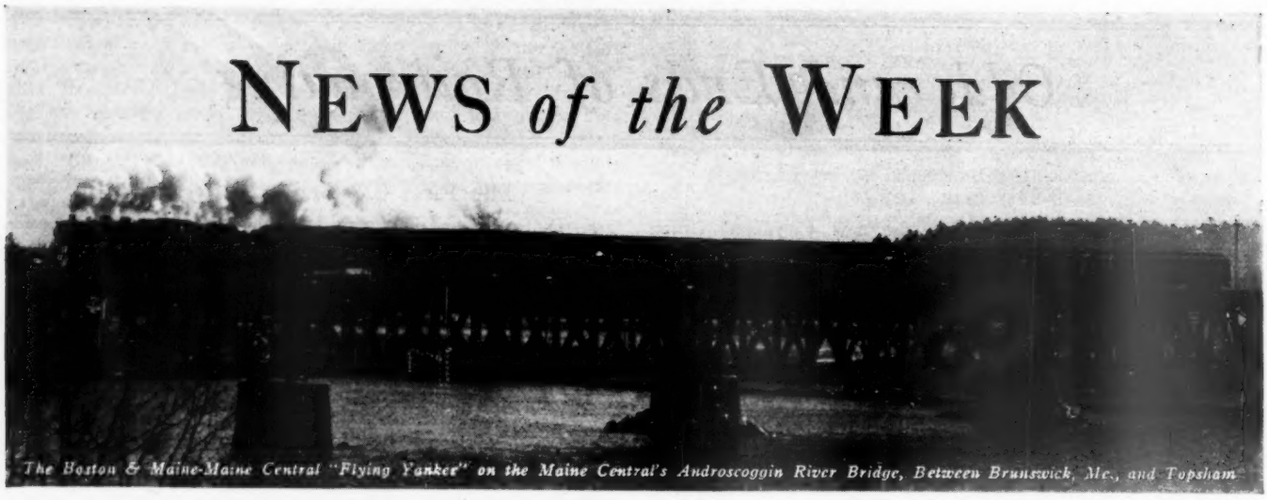
"I have seen this car, which is stored at the Wolverton, England, carriage works. It is still in first-class condition, and, considering when it was made, is a wonderful piece of work."

A Structure for the Model Locomotives

The civil engineers, as well as the mechanical engineers, are now represented in the hobby of building railway working models. Buel A. Fuller of San Diego, Cal., has completed a model of a 300-ft. through truss railway bridge for double-track operation, which is complete even to ties and rail. The model is

built on the scale of ¼ in. to 1 ft., and is 6 ft. 3 in. long, 16 in. high at its mid-point and has a 6¼ in. clearance from the top of rail to the bottom of the lower cross bracing. It is constructed of No. 28 and 30 gage galvanized iron and is made up of 2,436 separate pieces, exclusive of ties and rails, brazed together, and has sustained a load of 500 lb. Mr. Fuller spent about two years of spare time in its construction.

NEWS *of the* WEEK



The Boston & Maine-Maine Central "Flying Yankee" on the Maine Central's Androscoggin River Bridge, Between Brunswick, Me., and Topsham

CHARLES D. MAHAFFIE, heretofore director of the Bureau of Finance of the Interstate Commerce Commission, took the oath of office as a member of the commission on September 1, having been given a recess appointment by President Hoover to succeed Thomas F. Woodlock, resigned, while the Senate is not in session.

SIX PERSONS WERE KILLED and 11 were injured when the Texas Special of the St. Louis-San Francisco was derailed on August 31 about 14 miles west of St. Louis, Mo., by rocks that had been piled on the rails on a curve, probably by small boys who were in the vicinity at the time. Six cars left the track. The engineman, the fireman and four passengers were killed, while four members of the train crew and seven passengers were injured.

Method of Heating Air-Cooled Diner

Through an oversight, the method of operating, in winter, the Santa Fe air-conditioned and air-cooled diner, described beginning on page 362 of the *Railway Age* of August 23, was not made sufficiently clear. The car is heated for winter use with the Vapor car heating system, using fin pipes instead of ordinary pipes. This heating system is thermostatically controlled, the ventilation is provided in winter by the motor-driven blowers circulating air which is warmed by the Vapor system. The only difference from summer operation is that the compressors, ammonia evaporator and cooling water tower are not in operation.

New Record for Fuel Economy

Class I railroads in the first six months of 1930 obtained the greatest efficiency for any corresponding period on record in the use of fuel by road locomotives, according to reports filed by the railroads with the Interstate Commerce Commission. An average of 125 lbs. of fuel was required to haul 1,000 tons in freight service, including locomotive and tender, a distance of one mile, the lowest rate ever attained since the compilation of these reports began in 1918, being a reduction of 4 lb. under the best previous record established in the first half of 1929. Record efficiency also marked the use of fuel in the passenger service, an average of 15-lb. having been required to move each passenger train car one mile compared with 15.3 lbs. in the first six months in the preceding year.

Class I railroads in the first half of 1930 used for road locomotive fuel 50,916,925 tons of coal and 1,189,018,040 gallons of fuel oil.

Civic Bodies Approve C. N. R. Montreal Project

The council of the Montreal Board of Trade held a special meeting last week to consider the question of the Montreal Terminals of the Canadian National Railways, and came to the unanimous conclusion that, as the present plans are the result of a study by experts in railway engineering and operation, and were approved by Parliament after endorsement by the Metropolitan Commission and a special committee appointed by the City of Montreal consisting of technical representatives of practically all the transportation interests of the city, it would be exceedingly unwise to interfere with their prompt execution.

While the council's views will be set forth more formally and completely in a resoution which is being drafted, the unanimous opinion was that the Canadian National Railway authorities should be permitted to proceed without delay with the carrying out of the scheme as already approved.

Approval of the Canadian National terminal plan and implied objection to the move on foot to replace it by the Lancaster plan was conveyed in a resolution adopted by the St. Lambert City Council which was forwarded to the Dominion Cabinet.

Katy Renews Firebox in 64 Working Hours

Without any particular advance preparation or assembly of material, the Missouri-Kansas-Texas recently took a Mikado-type locomotive, No. 919, with a tractive effort of 63,900 lb., into its Bellmead shop, Waco, Tex., for Class II repairs, which includes a new firebox and general repairs to machinery. At the end of 64 shop working hours, this locomotive left the shop ready for a "break-in" trip. The progress of the various repair operations was as follows:

	Hrs.
Locomotive stripped and flues removed	8
Locomotive lifted from wheels and placed on blocks	11
Old firebox completely removed	16
Boiler sand-blasted and scale removed	20
Backhead braces repaired	21¾
New firebox in place, door sheet and flue sheet riveted, rivet holes in mud ring reamed and two small patches applied to third boiler course	26
Mud ring riveted and seams caulked, radial stays, staybolts, belly braces and flues applied and boiler ready for test	48
Hydrostatic test completed	51½
Locomotive wheeled	52
Lagging, jacket, running boards, cap and all appurtenances applied; valves set, locomotive coupled to tender, boiler fired and safety valve set ready for "break-in" trip	64

The only material provided in advance was the firebox sheets, placed in the shop so that work could be started on the box and the locomotive at the same time. There was a lapse of 21 hours from the time the locomotive entered the shop until the firebox was in place which was ample time for construction of the firebox.

In addition to the above repairs, this locomotive received the initial application of a power reverse gear and a brakeman's cupola on the tender. The Franklin trailer booster, with which the locomotive was equipped, was also given complete repairs.

Electric Service Inaugurated on Lackawanna

Electrical operation on the Delaware, Lackawanna & Western between Hoboken and Montclair, N. J., was inaugurated on September 3, when a 10-car train carrying Lackawanna officers and their guests made the initial trip between these two points. Persons making the journey included railway officers, officials of towns along the route and newspaper men; among this group of approximately 300 guests was Thomas A. Edison.

The train, which left Hoboken at 11 A.M., was followed later in the day by three other electric trains serving commuters over this section of the Lackawanna. Gradually other electric trains will be installed until steam power is entirely supplanted on suburban trains operating over this Montclair branch.

The entire Lackawanna electrification project involves the electrical operation of 70 miles of road including 160 miles of track. This opening of the Montclair

branch is expected to be followed during the latter part of September by the inauguration of electrical operation between Hoboken and South Orange and later to Morristown. By the end of the year electrical operation to Dover, Bernardsville and Gladstone is scheduled.

Equipment acquired for the new service includes 141 new steel cars seating 84 passengers each; a like number of Lackawanna suburban coaches were converted for operation as trailers. Equipment is of the multiple-unit type, one car and one trailer constituting a unit, and will be operated in trains of from two to 12 cars. These cars, as announced in the *Railway Age* of June 7, page 1394, were recently tested at Erie, Pa. They are powered by four 230 h.p. motors, while power is supplied to the cars by a 3,000-volt direct current contact system.

Mexican National Reorganization

A general reorganization of the National Railways of Mexico has been undertaken with a view to the resumption of interest payments on the railroad's debt and acquisition of a greater control in the affairs of the company by purchase of additional stock by the Mexican government, J. Sanchez Mejorada, executive president of the National Lines, stated in a recent interview at Mexico City.

Interest payments on the debt, according to an agreement reached recently in New York, will be made on a 50 per cent basis beginning in 1931, and will increase each year until normal payments are resumed in 1936. This interest will be paid to bond holders by the railways without the aid of the Mexican government. At the present time there is no immediate program for the formation of a new company to take over the lines. The Mexican government now owns 52 per cent of the stock, and it is planned that it will eventually obtain possession of 65 per cent, although no announcement has been made of the manner in which it will be acquired.

It is also planned to curtail the expansion program, cancelling all projects for the construction of new lines within the immediate future. When conditions permit it is expected that the Southeast lines, those between Santa Lucrecia, Ver. C., and Campeche, Cam., and between Uruapan, Mich., and Zitahuanejo, will be undertaken, as well as a line between Durango, Dgo., and Mazatlan, Sin.

Several branch lines which are not considered essential will be abandoned. One of these, a narrow gage line, which connects Pachuca, Hgo., with the Hidalgo division will be abandoned and a parallel standard-gage line will be rebuilt to compete with the Mexican Railway and a motor coach line to that city. There is an idea of eventually replacing all narrow-gage lines with standard gage construction.

In order to reduce operating expenses to a figure commensurate with the service provided, the National Railways are daily reducing forces by from six to ten men, instead of creating a difficult unemployment problem by discharging several thousand at one time. Those dismissed without previous notice are given three months' salary, in accordance with the Mexican constitution, while those who are given advance notice of their dismissal will remain in their present positions for 60 days. The shops at Durango will be closed within the immediate future and the small force still in service at the Piedras Negras (Coah.) shops will also be dismissed.

The reorganization program also calls for the return of a number of independent railroads, which are now operated by the National Railways, to their owners. In the event that their owners continue to refuse to accept them operation of the lines will be discontinued. The lines in this classification include the National of Tehuantepec, extending from Puerto Mexico, Ver. C., to Salina Cruz, Oax., the Mexican Oriental, the Oaxaca to Ejutla, the Barroteran to Muzquiz and others which have an operating ratio of more than 100 per cent.

The reorganization committee, of which General Calles is the head, is also conducting an investigation of the freight tariffs in order to reduce freight rates wherever practicable.

I. C. C. To Begin Hearings on Reciprocal Buying

The Interstate Commerce Commission has assigned for hearing at Chicago on September 30 its investigation of so-called "reciprocal buying" practices by railroads. Although the investigation was ordered on July 22, 1929, no hearings have thus far been held, but it has been carried on through field agents working under the direction of the commission's Bureau of Service, who have gathered a great deal of data from examinations of railroad records and through questioning of railroad men and representatives of shippers who have things to sell to the roads. They have also had access to the material gathered by the Federal Trade Commission in two proceedings on complaints issued by it against the Mechanical Manufacturing Company and officers of Swift & Co., and the Waugh Equipment Company and officers of Armour and Co.

The hearing at Chicago will be held before Director W. P. Bartel, of the Bureau of Service, and Special Examiner J. L. Rogers. It was announced that the evidence to be taken at the Chicago hearing will be principally that relating to the practices of a number of roads having headquarters at Chicago, the Atchison, Topeka & Santa Fe, the Chicago & Alton, the Chicago, Burlington & Quincy, the Chicago Great Western, the Chicago, Indianapolis & Louisville, the Chicago, Milwaukee, St. Paul & Pacific, the Chicago & North Western, the Chicago, Rock Island & Pacific, and the Illinois Central.

The commission's order provided for an inquiry "into and concerning the methods and practices employed by common carriers by railroad, subject to the interstate commerce act, in purchasing equipment, materials, supplies or other commodities or articles, with particular reference to the extent, if any, to which such purchase from any manufacturer, producer or dealer is dependent upon or influenced by the routing of traffic controlled directly or indirectly by such concern via the line or lines of the purchasing carrier, with a view to making such order or orders, or taking such other action in the premises as may be warranted by the record.

The Canadian Roads in July

The Canadian Pacific reports net earnings for the month of July of $3,213,056, a decrease compared with the same month of last year of $679,600, and a net for the seven months ended July of $12,619,110, against $20,249,488 in the like period of 1929. Gross for the month is shown at $14,874,631, against $19,078,500, a decrease of $4,203,869 on the same comparison.

Operating expenses show a reduction for the month of $3,524,268 at $11,661,575 while gross for the seven months at $98,009,606 shows a reduction from the same period of last year of $22,715,647, and operating expenses for that period are $15,085,268 lower at $85,390,495.

The following table shows the earnings, expenses and operating net for the month of July, and for the seven-month period ended with July, with comparisons:

	JULY		
	1930	1929	Decr.
Gross	$14,874,631	$19,078,500	$4,203,869
Exp.	11,661,575	15,185,843	3,524,268
Net	$3,213,056	$3,892,657	$679,600

	SEVEN MONTHS ENDING JULY		
	1930	1929	Decr.
Gross	$98,009,606	$120,725,252	$22,715,647
Exp.	85,390,495	100,475,764	15,085,268
Net	$12,619,110	$20,249,448	$7,630,377

During the month of July, gross revenues of the Canadian National, including the Central Vermont and excluding eastern lines, totaled $19,150,150. Operating expenses were $16,866,935 and operating net $2,283,214. The figures for the same period in 1929 were: gross revenue, $24,194,500; operating expenses, $20,345,980; net, $3,845,519.

To July 31, the aggregate gross revenues were $128,462,138, as compared with $155,038,319; operating expenses, $114,869,710, as compared with $129,484,028; net, $13,592,427, compared with $25,554,290.

Speeding Up of Consolidation Plan Credited to President

A declaration that the Interstate Commerce Commission accelerated its work on its railroad consolidation plan, which was promulgated last December, in accordance with provisions of the transportation act of 1920, "at the suggestion of President Hoover" and "with a view to furnishing more effective railroad service" is made in a statement which has been issued by the Republican National Committee, embracing a comparison of the Republican party platform pledges of 1928 and the accomplishments said to have been made under them. The statement refers to the plan, however, as if it had been "presented to Congress." It says that "under it the rail carriers

would be welded into a series of competing systems under arrangements providing for more economic operation through joint use of terminals and other facilities. This plan is now before Congress, which has been considering railroad consolidation legislation for a number of years." The law under which the plan was adopted by the commission deals with it rather as a guide for authorizations by the commission than as a basis for legislation, and it did not provide for its submission to Congress.

The list of accomplishments also includes the following statement as to waterways: "An enlarged national program for the development of inland waterways has been worked out both administratively and legislatively by the President and Congress. Appropriations for this purpose have been increased; the engineering direction wholly reorganized, and, for the first time, the nation is within a certainty of a complete system of improved barge transportation throughout the interior. Development of intra-coastal waterways is also being accelerated and both the interior and intra-coastal waterways will be of great assistance to agriculture in providing cheaper transportation to primary markets."

Meetings and Conventions

The following list gives names of secretaries, date of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—T. L. Burton, Room 5605, Grand Central Terminal Building, New York City. Next meeting, Toronto, Ont., 1931. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—Fred W. Venton, Crane Company, 836 So. Michigan Blvd., Chicago. Meets with Air Brake Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—J. D. Gowin, 112 W. Adams St., Chicago.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, Oct. 7-9, 1930, Atlantic City, N. J.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Room 400, Union Station, St. Louis, Mo. Next meeting June 16-19, 1931, St. Louis, Mo.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—J. H. Hawley (B. R. & P. Ry.) E. Salamanca, N. Y.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York. Next convention, September 28-October 2, 1931, Atlantic City, N. J.

AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.

Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Freight Station Section. — R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St. New York.

Protective Section.—J. C. Caviston, 30 Vesey St., New York.

Safety Section.—J. C. Caviston, 30 Vesey St., New York.

Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York. Next convention, Sept. 16-19, 1930, Royal York Hotel, Toronto, Ont.

Division II.—Transportation.—G. W. Covert, 59 East Van Buren St., Chicago.

Division III.—Traffic.—J. Gottschalk, 143 Liberty St., New York.

Division IV—Engineering.—E. H. Fritch, 59 East Van Buren St., Chicago. Next meeting, March 10-12, 1931, Palmer House, Chicago. Exhibit by National Railway Appliances Association.

Construction and Maintenance Section.—E. H. Fritch. Next meeting, March 10-12, 1931, Palmer House, Chicago.

Electrical Section. — E. H. Fritch. Next meeting, October 29, 1930, Stevens Hotel, Chicago.

Signal Section.—H. S. Balliet, 30 Vesey St., New York. Next meeting Arlington Hotel, Hot Springs, Ark., September 9-11, 1930.

Division V.—Mechanical.—V. R. Hawthorne, 59 East Van Buren St., Chicago. Next meeting, June, 1931.

Equipment Painting Section.—V. R. Hawthorne, 59 East Van Buren St., Chicago. Next convention, September 9-11, 1930, Congress Hotel, Chicago. Exhibit by Supply Men's Association.

Division VI.—Purchases and Stores.—W. J. Farrell, 30 Vesey St., New York, N. Y.

Division VII.—Freight Claims.—Lewis Pilcher, 59 East Van Buren St., Chicago. Next meeting, May 26-29, 1931, Louisville, Ky.

Division VIII.—Motor Transport. — George M. Campbell, 30 Vesey St., New York, N. Y. Next meeting, November 18-20, 1930, Chicago.

Car Service Division.—C. A. Buch, 17th and H. Sts., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Annual convention, October 21-23, 1930. Brown Hotel, Louisville, Ky. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—A. W. Large, Gen. Agri. Agt., C. R. I. & P. Ry., Chicago, Ill. Annual meeting, 1931, Philadelphia, Pa.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in co-operation with the American Railway Association, Division IV.—E. H. Fritch, 59 East Van Buren St., Chicago. Next meeting, March 10-12, 1931, Palmer House, Chicago. Exhibit by National Railway Appliances Association.

AMERICAN RAILWAY MAGAZINE EDITORS ASSOCIATION.—Miss E. Phillips, N. Y. N. H. & H. Magazine, New Haven, Conn. Next meeting, June, 1931, Philadelphia, Pa.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C., M., St. P. & P. R. R., 11402 Calumet Ave., Chicago. Annual convention, September 10-12, 1930. Hotel Sherman, Chicago. Exhibit by Supply Association of the American Railway Tool Foreman's Association.—Acting Secretary: H. W. Leighton, Harry W. Leighton Co., 565 W. Washington St., Chicago.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—R. E. Schindler, assistant secretary, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Paul D. Mallay, Johns-Manville Corp., 292 Madison Ave., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1104 Chandler Building, Washington, D. C. Next meeting, January 27-29, 1931, Philadelphia, Pa.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Annual convention, June 17-19, 1931, Royal York Hotel, Toronto, Ont.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Station, Chicago. Annual convention, October 21-24, 1930, Hotel Sherman, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, Transportation Building, Washington, D. C.

ASSOCIATION OF RAILWAY SUPPLY MEN.—J. W. Fogg, MacLean-Fogg Lock Nut Co., 2649 N. Kildare Ave., Chicago. Meets with International Railway General Foremen's Association.

BOILERMAKERS' SUPPLY MEN'S ASSOCIATION. — Frank C. Hasse, Oxweld R. R. Service Company, 230 N. Michigan Ave., Chicago. Meets with Master Boiler Makers' Association.

BRIDGE AND BUILDING SUPPLY MEN' ASSOCIATION.—W. H. Lawrence, Johns-Manville Corp., 41st St. and Madison Ave., New York. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 208 Wilson Ave., N. D. G., Montreal, Que. Regular meetings, 2nd Monday in each month, except June, July and August, Windsor Hotel, Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, Chicago & Alton, 3001 W. 39th Place, Chicago. Regular meetings, 2nd Monday in month, except June, July and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, Room 299, 610 So. Main St., Los Angeles, Cal. Regular meetings, second Monday of each month, except July, August and September, Room 299, 610 So. Main St., Los Angeles.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—F. G. Wiegman, 720 N. 23rd St., East St. Louis, Ill. Meetings first Tuesday of each month, except July and August, American Hotel Annex, 6th and Market Sts., St. Louis, Mo.

CENTRAL RAILWAY CLUB OF BUFFALO.—T. J. O'Donnell, 1004 Prudential Building, Buffalo, N. Y. Regular meetings, 2nd Thursday each month, except June, July, August, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—(See Master Car Builders' and Supervisors' Association.)

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 453 E. 6th St., Cincinnati, Ohio. Meetings 2nd Tuesday in February, May, September and November.

CLEVELAND RAILWAY CLUB. — F. L. Frericks, 14416 Alder Ave, Cleveland, Ohio. Meetings, first Monday each month, except July, August, September, Hotel Hollenden, Cleveland.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Annual meeting, September 23-25, 1930, Hotel Morrison, Chicago. Exhibit of International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.— J. H. Jones, Crucible Steel Company of America, 650 Washington Blvd., Chicago. Meets with International Railroad Master Blacksmiths' Association.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. T. Winkless, Room 700 La Salle Street Station, Chicago. Next meeting, May 5-8, 1931, Hotel Sherman, Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha St., Winona, Minn. Annual Convention, September 16-19, 1930, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—L. R. Pyle, Locomotive Firebox Co., 310 So. Michigan Ave., Chicago. Meets with International Railway Fuel Association.

MASTER BOILER MAKERS' ASSOCIATION.—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y. Exhibit by Boiler Makers' Supply Men's Association.

MASTER CAR BUILDERS' AND SUPERVISORS' ASSO-

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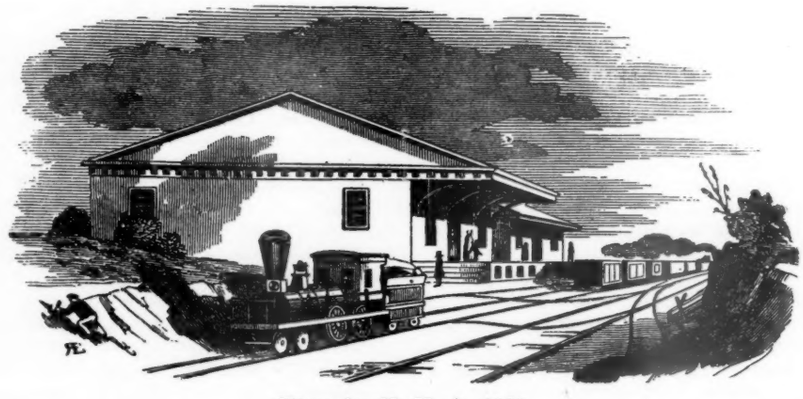

Waverly, N. Y., in 1851

From the Illustrated American News, New York; Picture Resurrected by the Erie Railroad

CIATION.—A. S. Sternberg, M. C. B. Belt Ry., of Chicago, 7926 South Morgan Street, Chicago. Exhibit by Supply Men's Association.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 270 Madison Ave., New York. Annual Convention, November 12-15, 1930, Charleston, S. C.

NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS.—Roy. M. Edmonds, 1252 Syndicate Trust Bldg., St. Louis, Mo.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Keily, 1014 South Michigan Ave., Chicago. Exhibit at A. R. E. A. convention.

NATIONAL SAFETY COUNCIL.—Steam Railroad Section: W. A. Booth, Can. Nat. Rys., Montreal, Que., Can. Annual Congress, September 29-October 4, William Penn and Fort Pitt Hotels, Pittsburgh, Pa.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2nd Tuesday in month, excepting June, July, August and September, Copley-Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB.—D. I. McKay, 26 Cortlandt St., New York. Regular meetings, 3rd Friday in month, except June, July and August, 29 W. 39th St., New York City.

PACIFIC RAILWAY CLUB.—W. S. Wollner, P. O. Box 3275, San Francisco, Cal. Regular meetings 2nd Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1124 Woodward Building, Washington, D. C. Annual convention, 1931, Mexico City, Mex.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 1112 Shoreham Building, Washington, D. C. Next meeting, November, 1930, Commodore Hotel, New York, N. Y.

RAILWAY CAR DEPARTMENT OFFICERS' ASSOCIATION.—(See Master Car Builders' and Supervisors' Association.)

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 1841 Oliver Building, Pittsburgh, Pa. Regular meeting, 4th Thursday in each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago. Meets with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—F. W. Venton, Crane Co., 836 S. Michigan Ave., Chicago. Meets with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md. Next meeting, October 21-23, 1930, St. Louis, Mo.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division, Purchases and Stores Division and Motor Transport Division, American Railway Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A. Division 1.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, 1217 Commercial Trust Bldg., Phila., Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvr., Road, Baltimore & Ohio, Pittsburgh, Pa. Exhibit by Track Supply Association. Next meeting, September 16-18, 1930, Hotel Stevens, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Drawer 24, M. P. O., St. Louis, Mo. Regular meetings, 2nd Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, West Nyack (Rockland Co.), N. Y. Meets with A. R. A. Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3rd Thursday in January, March, May, June, September and November, Ansley Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & C. Ry., Atlanta, Ga.

SUPPLY MEN'S ASSOCIATION.—E. H. Hancock, Treasurer, Louisville Varnish Co., Louisville, Ky. Meets with A. R. A. Div. V. Equipment Painting Section.

SUPPLY MEN'S ASSOCIATION.—Bradley S. Johnson. W. H. Miner, Inc., 667 The Rookery Building, Chicago. Meets with Master Car Builders' and Supervisors' Association.

TRACK SUPPLY ASSOCIATION.—L. C. Ryan, Oxweld Railroad Service Co., Carbon & Carbide Building, Chicago. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, O. Annual meeting, September, 23-26. 1930. Hotel Sherman, Chicago. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—W. J. Dickinson, 343 So. Dearborn St., Chicago. Regular meetings 3rd Monday each month, except June, July and August.

Traffic

Railroads operating between Chicago and the Twin Cities established a round trip fare of $9 for persons wishing to visit the Twin Cities over Labor Day, the rate being less than the cost of gasoline for an automobile trip. The round trip highway distance is 1,010 mi., and with a fuel consumption of 15 mi. per gal. at a cost of 19 cents per gal., the gasoline consumed on the trip amounts to $12.80. For those fortunate enough to have a fuel consumption as low as 20 mi. per gal., the cost of the automobile trip is $9.60 for gasoline alone.

The Chicago, Burlington & Quincy unit of the New Union passenger station at Omaha, Nebr., which will serve that road and the Chicago Great Western, was dedicated and formally opened on September 4. The Burlington Ak-Sar-Ben, on its regular trip from Omaha to Chicago was the first train to use the station after the opening. The station celebration coincides with the eightieth anniversary of the first operation of trains over the Burlington between Aurora, Ill., and Turner Junction, now West Chicago, on September 2, 1850.

The Nashville, Chattanooga & St. Louis and its motor transport subsidiary have asked the Railroad and Public Utilities Commission of Tennessee for permission to discontinue motor coach service between Cowan, Tenn., and Tracy City, 20 miles, and to reinstate rail service by means of a mixed train. The motor coach operation resulted in a loss of $7,511 during the first six months of 1930, and the mixed train service would effect a saving of $1,000 a month. Eighty per cent of the passenger traffic between the two cities moves at present by private automobile.

Express Business in Canada

A summary of the express business in Canada for the year 1929 has just been issued by the Bureau of Statistics at Ottawa, but there is no division of figures according to the various companies. The figures for the last ten years are as follows:

Year Ended Dec. 31st	Gross Earnings	Operating Expenses	Express Privileges	Net Operating Revenue
1919	$24,933,219	$13,227,652	$12,936,615	Dr. $1,231,048
1920	30,512,504	16,120,880	16,009,460	Dr. 1,617,836
1921	32,504,894	15,601,187	16,549,915	353,792
1922	28,697,332	13,596,518	14,581,789	519,025
1923	27,625,700	13,217,780	14,342,410	65,511
1924	26,196,017	12,723,651	13,557,168	Dr. 84,802
1925	25,876,342	12,336,485	13,312,960	226,897
1926	26,554,378	12,442,257	13,466,863	645,258
1927	26,532,182	12,548,374	13,275,355	708,453
1928	27,674,270	13,032,376	13,459,187	1,182,707
1929	27,758,385	13,480,028	13,598,575	679,782

Grain Rate Order Postponed

The Interstate Commerce Commission, on petition of the railroads, has postponed from October 1 to January 1 the effective date of its order prescribing a general revision of grain rates in the western district and for export. The postponement was asked on the ground that the time allowed was insufficient for the preparation of the tariffs. It had been estimated that the revision would reduce the revenues of the western roads by $15,000,000 a year.

Eastern Roads Ask Modification of Class Rate Order

The eastern railroads have filed with the Interstate Commerce Commission a petition for a modification in important respects of the commission's findings in the eastern class rate investigation case, stating that the effect of the rates prescribed by the commission will be to reduce their revenues generally, instead of increasing them and that "the present is no time to set up the basis for sweeping reductions in important key traffic nor even to experiment therewith." The report of the commission in this case made no estimate of an increase but said that the new system of class rates prescribed for official classification territory "should clearly not yield less than the present aggregate revenues from this traffic." Estimates that the rates would increase revenues $50,000,000 to $60,000,000 a year, however, were widely published, based on a traffic test made several years back on the basis of the rates proposed by the examiner in this case, which were somewhat modified in the final decision.

The petition states that the traffic executives of the eastern roads believe that the scales prescribed will greatly reduce the revenues now derived by the carriers from class rate and related traffic, not only under existing circumstances but even under normal conditions, and that the commission has prescribed for the present fifth and sixth classes percentages which, in conjunction with the level of the prescribed rates, would make serious inroads on revenues, more than offsetting whatever increase in revenues might result from the changes made in the fourth and higher classes. The roads urge particularly a reconsideration of the findings as to fifth and sixth class rates and also among others of the finding which exempted from any increase the rates on fresh fruits, vegetables, hay, dairy products, etc., which the petition says was not in the original scope of the investigation and is no longer to be justified by the Hoch-Smith resolution.

The rates prescribed, the petition says, would "seriously deflate" important areas in Trunk Line, New England and C.F.A. territories, and "thus will a subnormal fifth and sixth class level play havoc with carrier revenues—revenues which are even now, eleven years after the passage of the transportation act, well below the statutory return."

Equipment and Supplies

Freight Cars

THE MATHER STOCK CAR COMPANY, Chicago, is constructing 200 stock cars in its own shops.

JACOB DECKER & SONS, Mason City, Iowa, have given a contract to the Ryan Car Company to repair 50 refrigerator cars.

THE WHEELING STEEL COMPANY has given a contract to the Koppel Industrial Car & Equipment Company to make repairs to five steel hopper cars.

THE MEXICAN RAILWAY has ordered 85 box cars of 30 tons' capacity, 15 automobile cars of 30 tons' capacity and 15 flat cars of 40 tons' capacity from the Pressed Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of June 7.

Passenger Cars

THE ATCHISON, TOPEKA & SANTA FE is inquiring for 10 horse express cars, 79 ft. long.

THE NEW YORK CENTRAL has ordered 50 milk cars from the Merchants Despatch Transportation Company.

Iron and Steel

THE TEXAS & PACIFIC is inquiring for 400 tons of structural steel for a bridge at Turnbull, La.

THE UNION PACIFIC is inquiring for 400 tons of structural steel for a bridge over Crow creek in Wyoming.

Signaling

THE CHICAGO, BURLINGTON & QUINCY has ordered from the General Railway Signal Company an electric interlocking machine for Galesburg, Ill.; 114 working levers.

Miscellaneous

THE WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY has recently received two orders for Visicode type supervisory control equipment; these cover five equipments for the Long Island and 20 for the Reading Company; the latter order was reported in the *Railway Age* of August 30. Both of these orders include the switchboards for the main stations involved. The Visicode provides a means for remotely controlling and supervising a large variety of power apparatus. It provides continuous individual visual lamp indications for each piece of remotely controlled apparatus and operates over only two telephone type line wires. Where a number of stations are in the same general direction from the dispatching point, all of these stations may be so arranged as to operate over the same pair of line wires.

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The New Canadian National Hotel, The Nova Scotia, at Halifax, N. S., with the Entrance to the C. N. R.'s New Passenger Station at the Right

The landscapng back of the hotel and in the foreground was done by Canadian National forces on company property.

Supply Trade

F. A. Rumberger has been appointed representative of the **Browning Crane Company,** with headquarters at Cleveland, Ohio.

The Ohio Brass Company, Mansfield, Ohio, has moved its Dallas, Texas, office, from the Insurance building to the Allen building, corner of Commerce and Ervay streets.

Frank O. Farey, representative of **Robert W. Hunt & Company,** with headquarters at Montreal, Que., has been promoted to general manager with the same headquarters.

The Sheffield Steel Corporation, Kansas City, Mo., has opened an office at 1122 Straus building, Chicago, under the direction of **Ernest Baxter,** who has been elected vice-president, railroad division.

Burton Explosives, Inc., Cleveland, Ohio, a sales organization, has entered the explosives and chemical manufacturing field and is constructing a plant at Cleveland, Ohio, which will have an initial production of 12,000,000 lb. of high explosives in 1931.

The Wood Preserving Corporation, Pittsburgh, Pa., has been formed to take over the **Ayer & Lord Tie Company,** Chicago, and the **Century Wood Preserving Company,** Pittsburgh. The Ayer & Lord Tie Company was acquired by the **American Tar Products Company** in June, 1930, and the Century Wood Preserving Company in August, 1930. Under the new arrangement, the Ayer & Lord Tie Company and the Century Wood Preserving Company will be controlled by the parent company but will continue under their present names and managements.

Ambrose N. Diehl, who has been elected a vice-president of the **United States Steel Corporation,** with headquarters at New York, was born in York county, Pa., on October 20, 1876.

Ambrose N. Diehl

After attending the public schools he was graduated from York Collegiate Institute, York, Pa., in 1894, later receiving from the Pennsylvania State College, the degree of B. S. in 1898. He has been connected with the steel business since 1899, serving in various positions. In 1918 he was appointed general superintendent of the Duquesne works of the Carnegie Steel Company and since January, 1925, Mr. Diehl has been a vice-president of that company; he now becomes a vice-president to the United States Steel Corporation.

Carnegie Steel Company Elects New Officers

I. Lamont Hughes, the new president of the Carnegie Steel Company, has been identified with the industry for the past 33 years. He was born at Mercer, Pa., in January, 1878, and attended the common schools, later graduating from North Braddock, Pa., high schol. He began work in the engineering department of the Edgar Thomson works of the Carnegie Steel Company in September, 1897.

I. Lamont Hughes

William G. Clyde

He took charge of engineering for the Union Steel Company, now part of the American Steel & Wire Company in June, 1901, and went to Youngstown in January, 1905, as master mechanic of the bar mills of the Youngstown district of the Carnegie Steel Company. He was appointed assistant general superintendent of the bar mills of the Youngstown district of the Carnegie Steel Company in March, 1906, and five years later became general superintendent of these mills. In January, 1916, he was appointed assistant general superintendent of the entire Youngstown district of the Carnegie Steel Company. He subsequently served as general superintendent in charge of the Canadian Steel Company's project at Ojibway, Ontario, and was transferred in June, 1918, to the Neville Island gun plant at Neville Island, Pa., as general superintendent of the operations being carried out by the United States Steel Corporation for the government. Mr. Hughes became president in May, 1919, of the Lorain Steel Company, a subsidiary of the United States Steel Corporation, returning to the Carnegie Steel Company, Youngstown, as general superintendent in January, 1920. Five years later he became vice-president of the Carnegie Steel Company and since April, 1928, has served as a vice-president of the United States Steel Corporation.

Ralph H. Watson

Sydney Dillon

William G. Clyde, who resigned as president of the Carnegie Steel Company on account of ill health, effective September 1, was born at Chester, Pa., and attended the public schools of Chester, later graduating in the class of 1888 from the Pennsylvania Military College. He began work as a civil engineer with Ryan & McDonald, constructors, Baltimore, Md., and later became associated with Robert Wetherall & Company, machinists and founders of Chester. Mr. Clyde began his mill training with the Wellman Steel & Iron Company, Thurlow, Pa., as superintendent of the plate mills. He subsequently went to the Illinois Steel Company at South Chicago where he remained for six years. He then was appointed sales manager of the American Steel Hoop Company, at Philadelphia, remaining in that position until that company was taken over by the Carnegie Steel Company. After serving for three years in sales work at the Cleveland offices, Mr. Clyde was appointed assistant general sales manager of the Carnegie Steel Company, with headquarters at Pittsburgh and from March, 1918, he served as vice-president, general manager of sales and a director until his election as president of the same company in November, 1925.

Ralph H. Watson, who has been elected a vice-president of the Carnegie Steel Company, with headquarters at Pittsburgh, Pa., was born at Harvey, New Brunswick, on January 7, 1878. He attended the public schools of his native town and later was graduated from the Lawrence Scientific School at Harvard University. Mr. Watson has been in the service of the Carnegie Steel Company since 1902 having begun as a metallurgist's assistant at the Homestead works. He later held various positions until his appointment in April, 1928, as general superintendent of the Homestead works and now becomes a vice-president of the Carnegie Steel Company.

Sydney Dillon, who has been appointed assistant to the vice-president in charge of operations of the Carnegie Steel Company, was born at Altoona, Pa., on June 21, 1877, and was educated in the parochial schools at Braddock. From 1899 to 1916 he held various positions with that company, including that of assistant chief engineer at the Edgar Thomson works, and then as chief mechanical engineer of the Carnegie Steel Company until his recent appointment as assistant to vice-president as above noted.

Trade Publication

DUMP CARS AND GRADING EQUIPMENT.—This is the title of Catalog No. 80 of 144 pages which is being distributed by the Western Wheeled Scraper Company, Aurora, Ill. This catalog contains descriptions as well as explanations of the uses of the complete line of dump cars and ditching and grading equipment which is manufactured by this company. The book is bound attractively and is complete with numerous illustrations of Western Wheeled Scraper equipment, some in actual use.

Construction

BOSTON & MAINE.—This company has awarded to the New England Construction Company, Springfield, Mass., a contract for rebuilding a bridge at Buckland, Mass.

CANADIAN PACIFIC.—A contract for the grading for the construction of an extension from Vanguard, Sask., to a point on the Weyburn (Sask.)-Lethbridge (Alta.) line, about 35 miles, has been awarded to Fred Mannix, Calgary, Alta.

CHESAPEAKE & OHIO.—This road has awarded a contract to the M. A. Long Company, Baltimore, Md., for the construction of an addition to its Calumet elevator "A" at 103rd street and Calumet river, South Chicago, Ill. The estimated cost of the work is $300,000.

ERIE-NEW YORK, CHICAGO & ST. LOUIS.—These two companies have awarded to J. W. Cowper, Inc., Buffalo, N. Y., contracts for the construction of a produce terminal and market at Clinton street and Bailey avenue, Buffalo, as described in the *Railway Age* of May 10. The new terminal includes four fireproof buildings each 70 ft. by 264 ft. and one building 82 ft. by 100 ft., all served by paved driveways, while the cost of the entire project is estimated to be in the neighborhood of $1,000,000.

MONTANA POWER COMPANY.—This company, whose headquarters are at Butte, Mont., plans to construct a nine-mile branch line railroad from a point on the Northern Pacific at Pablo, Mont., to the site of a new power plant on the Flathead river. Construction is expected to start within 30 days.

NEW MEXICO LUMBER COMPANY.—This company, of which J. S. Barlow, Dallas, Tex., is engineer, plans the construction of a railroad between McPhee, Colo., and Terris, about 15 miles.

NEW YORK CENTRAL.—The New York Public Service Commission has approved specifications and estimates of cost amounting to $151,700, exclusive of land and damages, submitted by this company for the elimination of a grade crossing on the Utica-Frankfort state highway, 3.8 miles east of Utica, N. Y., station, and of its Stop No. 2 crossing, 5.1 miles east of South Utica station, in the town of Frankfort, N. Y.

NEW YORK CENTRAL.—The New York Public Service Commission has directed this company to prepare plans and maps showing land required for the elimination of grade crossings on the West Henrietta-Rochester County highway, 1.2 miles west of Ridgeland station, Henrietta, N. Y., and of Buckhouts crossing, about one mile south of Briar Cliff Manor station, N. Y. The commission has also approved detailed plans submitted by this company for the elimination of the Echo Lake-Pines Bridge County highway crossing, 1.3 miles north of Millwood station, New Castle, N. Y.

NORTHERN ALBERTA.—Plans have been filed with the British Columbia government for the construction of an extension from Hythe, Alta., west, into the southeast portion of the Peace River block in British Columbia, to Dawson creek, about 25 miles.

PACIFIC GREAT EASTERN.—This company receives bids until September 10 for the construction of the sub-structure of a bridge over the Fraser river, near Lillooet, B. C.

PACIFIC GREAT EASTERN.—A contract for the fabrication of the superstructure of a new bridge over the Fraser river at Lillooet, B. C., has been let to the Dominion Bridge Company, Toronto, Ont. The bridge will involve an expenditure of about $200,000.

PENNSYLVANIA.—The Public Service Commission of New York has approved a general plan submitted by this company for the elimination of its grade crossings at South Main, Miller and LaFrance streets and South avenue, Elmira, N. Y.

PENNSYLVANIA.—This company has awarded to Allen N. Spooner & Son, Inc., New York, a $61,000 contract for the construction of protection fenders along the new channel of the Hackensack river from the end of the state highway bridge fenders on piers 6 and 7, bridge 4.21, to and beyond piers 5 and 6 of bridge 4.25, all at Marion, Jersey City, N. J.

PENNSYLVANIA.—The New York Public Service Commission has approved specifications and estimates of cost totaling $31,400 for the elimination of the Hitcomb, Shreve and Osborne crossings of this company's tracks in Clymer and Sherman, N. Y., (see *Railway Age*, July 12), and of $127,150 for the elimination of the Castile road crossing in Genesee Falls, N. Y.

PERE MARQUETTE.—A contract has been awarded to the Stevens Construction Company, Cleveland, Ohio, for the revision of grades and track extensions at St. Joseph, Mich., at a cost of $96,000. A contract for the installation of a new turntable and the extension of the turntable pit at Grand Rapids, Mich., has been let to the Barnes Brothers Construction Company, Grand Rapids, at an approximate cost of $78,000. The Jutton Kelly Company, Detroit, Mich., has been awarded contracts for the construction of grade separation structures at Fort street and Dix avenue, Detroit. The Fort street structure will involve an expenditure of about $300,000, while the Dix avenue structure will cost approximately $250,000. A contract for the construction of a new water treating plant at Wyoming Yard, Grand Rapids, has been let to the Nelson Water Service Company, Chicago, at a cost of $50,000.

WESTERN MARYLAND.—A contract for repairs to a grain elevator at Port Covington, Md., has been awarded by this company to the M. A. Long Company, Baltimore, Md. An expenditure of approximately $75,000 is involved.

Financial

ALCOLU.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon 21 miles of its line, from Black River Junction to Olanta, S. C.

CHICAGO & NORTH WESTERN.—*Bonds.*—The Interstate Commerce Commission has authorized this company to procure the authentication and delivery of $1,200,000 of its 4½ per cent general mortgage bonds of 1987 in partial reimbursement to its treasury for capital expenditures.

CHICAGO WAREHOUSE & TERMINAL.—*Notes.*—The Interstate Commerce Commission has authorized this company to issue $150,000 of promissory notes to be delivered to the Chicago & North Western in evidence of advances made in connection with the construction of new freight facilities at the latter company's Merchandise Mart at Chicago.

CINCINNATI UNION TERMINAL COMPANY.—*Bonds and Notes.*—The Interstate Commerce Commission has authorized this company to procure the authentication and delivery of $12,000,000 of first mortgage 4½ per cent gold bonds, to be held in the treasury until further order, and to issue $15,000,000 of notes, to be sold at not less than their face value, to procure funds for construction work in connection with the passenger terminal at Cincinnati. The proprietary companies also were authorized to assume obligation and liability as guarantors of the bonds.

HOBART SOUTHERN.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire and operate a line of 6.41 miles from Hobart Mills to Truckee, Cal., now operated by the Hobart Estate Company, and also for authority to issue $170,000 of capital stock for the purpose.

LONG ISLAND.—*Equipment Trust.*—The Interstate Commerce Commission has authorized this company to assume liability for $1,305,000 of its 4½ per cent equipment trust series T certificates, maturing in installments between 1931 and 1945, the issue to be sold to the highest bidder, Salomon Brothers & Hutzler and the First National Bank (New York), at 99.95, making the average annual cost to the railroad 4.508 per cent.

LOUISVILLE & NASHVILLE.—*Bonds.*—The Interstate Commerce Commission has authorized this company to procure the authentication and delivery of $17,311,000 of first and refunding series C, 4½ per cent bonds.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $4,106,000 of first refunding mortgage series B, 5½ per cent bonds maturing in 1978 to be sold at 96⅓ to Dillon, Read & Co., making the average annual cost to the railroad 5.71

per cent. The issue is guaranteed by the Canadian Pacific.

NATIONAL OF MEXICO.—*New Directors Elected.*—Juan Andrea Alamazan, secretary of communications and public works of Mexico, Frederico Ramos, Benjamin Mendez, Manuel E. Otalora and Fernando Diez Barroso have been elected members of the board of directors of this company for Mexico for the period of 1930-1931.

NEW YORK, CHICAGO & ST. LOUIS.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $36,000,000 of refunding mortgage 4 per cent bonds, to be sold at not less than 95 and interest to the Guaranty Trust Company and Lee, Higginson & Co. The proceeds are to be used to retire an aggregate of $33,993,000 of outstanding obligations.

NEW YORK, CHICAGO & ST. LOUIS.—*Bonds.*—The Guaranty Co., Lee, Higginson & Co., Harris Forbes & Co., and Dillon, Read & Co. are offering, subject to the approval of the Interstate Commerce Commission, $36,600,000 of series C, 4½ per cent refunding mortgage bonds of this company, due in 1978. The issue is priced at 97¾ to yield over 4.6 per cent.

PITTSBURGH & WEST VIRGINIA.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $5,000,000 of first mortgage 4½ per cent bonds, the proceeds to be used in the construction of its Connellsville and Donora extensions.

TOLEDO TERMINAL. — *Bonds.* — Halsey Stuart & Co. are offering $250,000 of first mortgage 4½ per cent bonds of this company at 98.50 yielding about 4.60 per cent. Proceeds of the bonds which mature in 1957 will be used to reimburse the company for capital expenditures.

WESTERN PACIFIC.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $5,000,000 of first mortgage 5 per cent bonds, maturing in 1946, to be sold to the highest bidder at not less than 97½, which would make the annual cost to the railroad 5.24 per cent. The Sacramento Northern is authorized to deliver to the Western Pacific for pledge under its first mortgage a 5¼ per cent promissory note for $1,589,120 in reimbursement for capital expenditures.

Dividends Declared

Boston & Albany.—2 per cent, quarterly, payable September 30 to holders of record August 30.

Chesapeake & Ohio.—Preferred, 3¼ per cent, quarterly, payable January 1, 1931, to holders of record December 8.

Erie & Pittsburgh.—$.87½, quarterly, payable September 10 to holders of record August 30.

Pere Marquette.—Common, 1½ per cent, quarterly, payable September 30 to holders of record September 8; Prior preference, 1¼ per cent, quarterly; Preference, 1¼ per cent, quarterly, both payable November 1 to holders of record October 3.

Pittsburgh & West Virginia.—Common, 1½ per cent, quarterly, payable October 31 to holders of record October 15.

Average Prices of Stocks and of Bonds

	Sept. 2	Last week	Last year
Average price of 20 representative railway stocks.	115.40	113.02	164.06
Average price of 20 representative railway bonds..	95.53	95.52	89.53

Railway Officers

Executive

Charles E. Carlson, first vice-president of the Duluth, Missabe & Northern, has been elected president, with headquarters as before at Duluth, Minn., succeeding **William A. McGonagle,** deceased. **E. H. Dresser,** chief engineer, with headquarters at Duluth, has also been elected vice-president to succeed Mr. Carlson.

Financial, Legal and Accounting

T. A. Saenz, auditor of material accounts of the National of Mexico, has been appointed freight claim agent, with headquarters at Buena Vista station, Mexico, D. F. **Manuel Gonzalez Quintana** has been appointed auditor of material accounts to succeed Mr. Saenz, with temporary headquarters at the Buena Vista station.

Charles M. Sheafe, Jr., general solicitor of the New York, New Haven & Hartford, has tendered his resignation to take effect at the pleasure of the company. Mr. Sheafe was born at Holden, Mo., on August 14, 1874. He attended Leland Stanford, Jr., University in 1893 and 1894 and thereafter attended Harvard University, from which institution he received the degree of A. B. in 1898 and Ll. B. in 1901. He entered railway service on May 1, 1905, as assistant attorney for the New York, New Haven & Hartford at New York. In 1908 he was promoted to attorney and, in 1914, to counsel for the same company with the same headquarters. In October, 1921, he was appointed general solicitor from which position he is now resigning.

Operating

B. H. Lord, traffic manager of the Wrightsville & Tennille, the Wadley Southern, the Louisville & Wadley, the Sylvania Central and the Short Lines Motor Transport Company, has been appointed general manager of those companies in charge of traffic and transportation, with headquarters as before at Dublin, Ga.

W. J. McWhorter, superintendent of the Nashville division of the Nashville, Chattanooga & St. Louis, with headquarters at Nashville, Tenn., has also been appointed superintendent of the Paducah and Memphis division, succeeding **W. J. Hills,** who has been appointed general agent in the transportation department, with headquarters as before at Paducah, Ky.

W. E. Lamb, who was granted a leave of absence on June 15, has resumed his duties as superintendent of the Arkansas division of the Missouri Pacific, with headquarters at Little Rock, Ark. **J. S. Bassett,** acting superintendent of the Arkansas division, has been appointed trainmaster of the Wagoner district of the Central division, with headquarters at Van Buren, Ark.

Alberto Galvan, who was superintendent of the Tampico, Tam., terminals of the National of Mexico until that position was abolished on August 1, has been appointed superintendent of the North division, with headquarters at Monterrey, N. L., succeeding **A. R. Mendoza,** who has been called to Mexico, D. F., and will be assigned to other duties. **A. E. Vera,** superintendent of the Monclova division, with headquarters at Monclova, Coah., has been transferred to the Durango division, with headquarters at Durango, Dgo. The position of superintendent of the Tehuantepec and Pan-American divisions, with headquarters at Matias Romero, Oax., has been abolished and the jurisdiction of the superintendent of the Isthmus division, **J. I. Garcia,** with headquarters at Tierra Blanca, Ver. C., has been extended to include those divisions.

Andrew R. Taylor, who has been promoted to assistant general superintendent of transportation of the Missouri Pacific lines, with headquarters at St. Louis, Mo., has been engaged in railway service for more than 42 years. He was born at Jonesboro, Tenn., on December 28, 1871, and attended high

Andrew R. Taylor

school at Parrotsville, Tenn. While attending college at Abingdon, Va., Mr. Taylor learned telegraphy from a school mate and obtained his first railway experience as an agent and telegrapher on the East Tennessee, Virginia & Georgia (now part of the Southern), in May, 1888. From 1890 to 1906 he served successively as a telegrapher, agent and dispatcher on the Richmond & Danville (now part of the Southern), at West Point, Va., Danville and Richmond, as dispatcher and chief dispatcher and trainmaster on the Illinois Central at Jackson, Tenn., and Water Valley, Miss., and as dispatcher and chief dispatcher on the Missouri Pacific at Hoisington, Kan., and McGehee, Ark. He was then advanced to trainmaster at Monroe, La., and in August, 1912, he was promoted

to superintendent of the Louisiana division at the same point. Twelve years later he was transferred to the Arkansas division, with headquarters at Little Rock, Ark. In February, 1929, he was appointed inspector of transportation of the Missouri Pacific Lines, with headquarters at St. Louis, his promotion to assistant general superintendent of transportation of those lines becoming effective on August 1.

Engineering, Maintenance of Way and Signaling

Frederic J. Taylor, district engineer on the Northern Pacific at Livingston, Mont., has been transferred to St. Paul, Minn., and the position of district engineer at the former point has been abolished. Mr. Taylor succeeds **Henry F. Brown,** district engineer at St. Paul, who has been appointed assistant district engineer at that point.

O. F. Arthur, division engineer of the Rio Grande division of the Atchison, Topeka & Santa Fe at Albuquerque, N. M., has been transferred to the Slaton division of the Panhandle & Santa Fe, with headquarters at Slaton, Tex., succeeding **L. V. Lienhard,** who has been appointed assistant division engineer at San Angelo, Tex. **J. A. Noble,** division engineer of the Arkansas River division of the Santa Fe at La Junta, Colo., has been transferred to the Pecos division at Clovis, N. M.

L. J. Hughes, system engineer maintenance of way of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been appointed engineer maintenance of way of the first district, with headquarters at Des Moines, Iowa, succeeding **A. C. Bradley** who has been appointed division engineer of the Iowa division at the same point. Mr. Bradley replaces **W. E. Heimerdinger** who has been transferred to the Cedar Rapids division at Cedar Rapids, Iowa. The position of engineer maintenance of way of the Rock Island system was abolished on September 1.

Traffic

Eugene J. Grimes, Jr., general agent of the New York, New Haven & Hartford at New York, has been appointed general baggage, mail and express agent, with the same headquarters, succeeding **George A. Morton,** who has retired after 43 years of service.

James P. Anderson, assistant to the general traffic manager—passenger, of the Pennsylvania, with headquarters at Chicago, retired from active duty on September 1 after more than 50 years service with that railroad. He was born at Beaver, Pa., on August 29, 1862, and entered railroad service in 1879 as a clerk on the Allegheny Valley. With that railway he advanced through the positions of chief clerk in the general passenger department, traveling passenger agent and general passenger agent. When the Pennsylania absorbed the Allegheny Valley in 1900 he was appointed division ticket agent on the former road at Pittsburgh, Pa. With the Pennsylvania Mr. Anderson advanced through the positions of district passenger agent at Pittsburgh, assistant general passenger agent at Philadelphia, Pa., and general passenger agent at the

James P. Anderson

latter point. In 1917 he was promoted to passenger traffic manager at Philadelphia, then being transferred to Chicago in 1920. On July 1, 1929, Mr. Anderson was appointed assistant to the general traffic manager—passenger, at Chicago, a position he held until his retirement on September 1.

Mechanical

W. A. Kelly, assistant master mechanic on the Chicago, Burlington & Quincy at Ottumwa, Ia., retired from active duty on September 1, after 50 years of service and the position of assistant master mechanic at that point has been abolished.

The headquarters of **A. H. Bierne,** master mechanic of the New Mexico division of the Atchison, Topeka & Santa Fe, have been transferred from Raton, N. M., to Albuquerque. **J. P. McMurray,** master mechanic of the Rio Grande division, which has been consolidated with the New Mexico division, has been appointed assistant master mechanic of the latter division, with headquarters at El Paso, Tex.

Obituary

Charles B. Hill, trainmaster on the Nashville division of the Nashville, Chattanooga & St. Louis, died at Nashville, Tenn., on July 26.

Sheldon W. Brown, formerly general superintendent and assistant to the general manager of the Michigan Central, died at his home in Detroit, Mich., on August 31, after an illness of more than a year. He was 72 years old, and had been in retirement since 1928.

Stoerk J. Bratager, who retired as assistant chief engineer of the Northern Pacific with headquarters at St. Paul, Minn., on June 1, 1925, died in that city on August 29 after an illness of five years. Mr. Bratager was born at Bergen, Norway, on June 7, 1860, and studied for six years in technical schools in that country. He entered railway service in 1883 as a draftsman on the Northern Pacific then being advanced through various positions in the engineering department, including that of principal assistant engineer at St. Paul. In the early part of 1923 he was promoted to assistant chief engineer, a position he held until his retirement two years later.

Edmond D. Bronner, vice-president of the Michigan Central, with headquarters at Detroit, Mich., since 1917, and during government control of the railways federal manager of that road, died at his home in that city on September 1 after an illness of three months. Mr. Bronner, who served as the executive head of the Michigan Central at Detroit, had been connected with the road for more than 50 years. He was born at Buffalo, N. Y., on February 15, 1859, and was a graduate of the United States Naval Academy. In July, 1880, he entered railway service as a draftsman in the car department of the Canada Southern (now a part of the Michigan Central). Later he was transferred to the West Detroit car shops of the Michigan Central and in 1885 he was advanced to assistant general foreman of those shops. Mr. Bronner continued his service in

Edmond D. Bronner

the mechanical department, being promoted to general foreman of shops in 1886, to master car builder in 1890, to assistant superintendent of motive power and equipment in 1896 and to superintendent of motive power and equipment in 1900. In 1912 he was further promoted to general manager of the Michigan Central, then being elected vice-president and general manager in 1917. From June 10, 1918, to March 1, 1920, he served as federal manager of the Michigan Central and on the later date he resumed his position as vice-president, though at that time he relinquished his duties as general manager. During practically his entire service with the Michigan Central Mr. Bronner's headquarters have been located in Detroit or its immediate vicinity.